MACWORLD

May 1986 $3.95
Canada $4.95

The Macintosh™ Magazine

Faster and Smarter

New Mac HFS software organizes your files for fast access

Three Powerful Data Managers

On-Line Network of the Future

Cut Keystrokes with Macros

Expert Systems for the Macintosh Now!

Borland's SideKick and PhoneLink
the world, and double your

NEW VERSION 1.1

SideKick, The Macintosh Office Manager, now supports MacPlus (128K) and Finder 5.1 for the same low price—$99.95. An upgrade is available from Borland for $19.95. The upgrade is FREE if you purchased SideKick after 12/15/85. For more information, call (408) 438-8400.

Borland products include Turbo Pascal; Turbo Database Toolbox; Turbo Lightning; Turbo Graphix Toolbox; Turbo Tutor; Turbo GameWorks; Turbo Editor Toolbox; Reflex, The Analyst; SideKick; SideKick, The Macintosh Office Manager; Traveling SideKick; and SuperKey—all of which are trademarks or registered trademarks of Borland International, Inc. or Borland/Analytica, Inc.

clear your desk, connect you to productivity for only $99.95

SideKick,® The Macintosh™ Office Manager,™ gets rid of antiques like desktop phone directories, calculators, calendars, notepads, clocks, adding machines, and similar clutter. Sweeps all that off your desk and into your Mac. You can now bring true desktop organization, information management, and telecommunications to your Mac and do all that *while you're running other programs.*

What PhoneLink™ does for you

In true multi-tasking style, PhoneLink automatically dials for you *even while your modem is in use* on some other task, like sending or receiving a file. This one cubic-inch piece of hardware plugs into your Mac's sound port and will dial all your phone numbers for you. You can install your PhoneLink in a few seconds, and take extra pleasure in the fact that it didn't cost you anything because it came free with your new SideKick.

What SideKick does for you

- Gives you a full-screen editor and mini-word processor that lets you jot down notes, create and edit files, and/or be used in conjunction with programs like MacWrite or MacPaint.
- Provides you with a telecommunications program that sends and receives data from any on-line network or bulletin board *while using* other applications. (You need a modem for this feature.)
- Lets you tap into a full-featured financial and scientific calculator that will let you print out a paper tape of your work.
- Offers you a print spooler that prints any text file while you run other programs.
- Shows you an instant calendar—by day, week, or month—which you can also print out.
- Reminds you of important dates/times/appointments with a "things-to-do" file.
- Alerts you to engagements with a convenient alarm system.
- Tells you what you're spending in telephone charges by calculating the cost of every call to whatever area code or time zone.
- Keeps you aware of business and travel expenses.
- Gives you a credit card file that tracks entries, balances, and limits.
- Arms you with a report generator that prints out your mailing lists, calendar, or phone directory.
- Tells you the time with a sweep-hand analog clock.
- Gives you instant on-line "Help" with one mouse click.

Get both SideKick, The Macintosh Office Manager and PhoneLink for only $99.95

SideKick for the Mac is an electronic leap that projects you and your Mac into the real world. But you're getting much more than that. You're getting SideKick, you're getting PhoneLink, and you're getting our legendary 60-day money-back guarantee.**

SideKick is not copy-protected. It will clear your desk and do miracles for your productivity—and do all that for only $99.95.

"Take my compliments as a user. When I see SideKick, I know I want it.

Jean-Louis Gassée, VP, Product Development, Apple Computer

SideKick is the first product for the Mac that begins to make real the promise of an electronic desktop.

Lawrence J. Magid, Chicago Sun Times"

YES! I want the best

Rush me SideKick and PhoneLink at

$99.95

To order by phone, or for a dealer nearest you,

call (800) 255-8008

in CA call (800) 742-1133

___ *SideKick/PhoneLink at $99.95* $ ___

Outside USA add $10 per copy. CA and MA res. add sales tax $ ___

Amount Enclosed $ ___

Payment: VISA MC Bank Draft Check

Credit Card Exp Date ___ / ___

Card # |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

NOT COPY-PROTECTED
60-DAY MONEY-BACK GUARANTEE*

Name: ___

Shipping Address: ___

City: ___

State: ___ *Zip:* ___

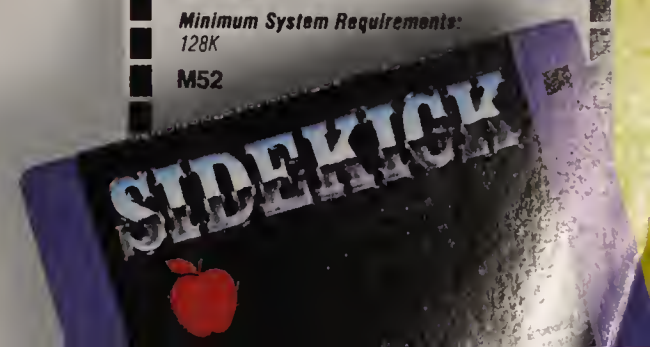
Telephone: ___

CODs and purchase orders WILL NOT be accepted by Borland. Outside USA make payment by bank draft, payable in US dollars drawn on a US bank.

***YES, if within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department and we will gladly arrange a refund.*

Minimum System Requirements: *128K*

M52



4585 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
(408) 438-8400 TELEX: 172373

SideKick is a registered trademark and PhoneLink is a trademark of Borland International, Inc. The Macintosh trademark is licensed to Apple Computer, Inc. MacPlus is a trademark of Apple Computer, Inc. MacWrite and MacPaint are published by Apple Computer, Inc. Copyright 1986 Borland International BI-1032A

Circle 381 on reader service card

MACWORLD

May 1986

The Macintosh™ Magazine

Getting Started

92 **Order out of Chaos**
Danny Goodman
A big plus with the new Macintosh: the Hierarchical File System blazes a trail to a civilized and flexible organization of files within folders. Take a guided tour with this introduction.

Review

100 **New Relations**
Jim Heid
Looking for a data manager that's a good match for complex tasks? Consider three recent entries to the relational database field: Singular Software's *Interlace,* Eqtron's *MacBase,* and Blyth Software's *Omnis 3.*

108 **Cutting Keystrokes**
Danny Goodman
Affinity Microsystems' *Tempo* delivers a printout—or performs about any other procedure—at the touch of a single key with *macros,* automated sequences of keystrokes and mouse moves.

State of the Art

114 **Tools for Thinking**
Tom Meramaa and Daniel Farber
The next wave of microcomputer development is software that puts into practice the principles of expert systems. Neuron Data's *Nexpert* brings the technology to the Mac.

Hands On

122 **Putting VideoWorks to Work**
Erfert Nielson
Action speaks louder. Use Hayden's *VideoWorks* to move your audience with an animated business presentation.

Community

128 **The Telecom Link**
Tom Moran
Apple Computer talks to its dealers via AppleLink, a prototype of a truly user-friendly network that may soon reach the rest of us.

Departments

13 **Personal Computer Games Come of Age**
David Bunnell

25 **Note Pad**
Dean Gengle
A network observer predicts that on-line services won't catch on with the public until the services become as easy to use as *MacPaint.*

On the Cover
Apple's long-awaited Hierarchical File System lets you nest files within files. See "Order out of Chaos," page 92.

Database data. Shopping for database power? See the comparison table of six relational databases in "New Relations," page 98.

31 **Graphic Details: Notes from a Novice Publisher**
Steven Levy

41 **Letters**

63 **Macworld View**
Software entrepreneurs in cahoots, a way to take the cramming out of veterinary training, and other news and notes for the Macintosh community.

71 **Get Info**
Lon Poole
Macworld's tutor answers questions about alarms, labels, *XY* graphs in *Excel,* a new Imagewriter printing oddity, and other Macintosh concerns.

137 **Macware Reviews**
▪ *PC MacBridge* Tangent Technologies' add-on board puts the IBM PC on speaking terms with Apple's LaserWriter.
▪ *Consultant* Whether you're brainstorming or devising step-by-step strategy, *Consultant* helps you make decisions.
▪ *Fokker Triplane Flight Simulator* Experience the thrill of a World War I dogfight as you fly the simulated skies.
▪ *Hard Disk Util* This handy utility lets you run programs on a hard disk without inserting master disks.
▪ *Housekeeper* Keep track of your possessions with an easy-to-use home inventory program.
▪ *Mouse Exchange BBS* With a Mac, a modem, and *Mouse Exchange,* anyone can set up a bulletin board system.
▪ *4paint* Prepare sketches for *MacPaint* drawings with *4paint*'s grid, curved lines, and full-page layout.

179 **Open Window**
Edited by Jim Heid
An exchange of Macintosh discoveries, including a faster version of BASIC, speedier printing in *Microsoft Word,* and a method for unlocking a spreadsheet.

171 **Macworld Directory**

Photo/illustration credits
David Bishop, 123; Martin DeLeon, 129; Mark Hanauer, 65; Terry Heffernan, cover; Ed Kashi, 63; Bud Lee, 67; Will Mosgrove, 115; Jeffery Newbury, 109; Roger Ressmeyer, 128, 130; George Steinmetz, 13, 25, 71; Fred Stimson, 92-93; David Suter, 31; Mark Ulrich, 41; Mick Wiggins, 101, 137, 144, 152.

Indexes

176 **Advertisers**
177 **Products**

MACWORLD

David Bunnell
Publisher

J. Kelley Younger
Executive Editor

Jerry Borrell
Editor

Jacqueline Poitier
Associate Publisher,
Art and Design

Editorial
Associate Editors: Daniel Farber, Adrian Mello
Technical Editor: David Ushijima
Assistant Editors: J. E. Arcellana, Erfert Nielson
Editorial Manager: Janet McCandless
Senior Copy Editor: Kathleen Christensen
Copy Editors: Nancy E. Dunn, Joe Matazzoni
Editorial Assistant: Heidi Mitchell
Assistant to the Executive Editor: Gina Vanlue
Editorial Secretary: Eileen Drapiza
Contributing Editors: Danny Goodman, Jim Heid, Steven Levy, Gordon McComb, Lon Poole, Jeffrey S. Young

Art and Design
Art Director: Bruce Charonnat
Designer: Dennis McLeod
Associate Art Director: Christopher Burg
Design Associates: Leslie Barton, Victoria Floyd
Design Consultant: Spiegelman Design Associates, Inc.

Production
Director: Herbert Linden
Senior Production Managers: Frances Mann, Lee R. Trevino
Editorial Production Manager: Ellyn L. Hament
Production Editor: James Felici
Ad Traffic: Jayne Boyer
Telecommunicators: Mark L. Duran, Susan M. Ford, Virginia Weir
Display Advertising Supervisor: Georgia George
Assistant: Otto Waldorf

Research
Associate Publisher/Director: Cheryl Woodard
Manager: Gary L. Rocchio
Research Analyst: Ralph Ames
Assistant: Steven York

Corporate Development
Manager: Karen Wickre
Special Projects: Jeffrey S. Glines
International: Karen Dowell
Administrative Assistant: Gloria C. Sundin

Marketing and Advertising Sales
Associate Publisher/Director: James E. Martin
Regional Advertising Manager/
No. California (San Francisco), Texas: Penny Rigby (415/861-3861)
No. California (San Jose), Northwest: Patricia Navone (415/861-3861)
Midwest: Jeff Edman (312/827-4477)
East: Linda Holbrook (617/879-0700)
Southeast: Judy Sutter (404/394-0758)
Southern California/Southwest: Michela O'Connor (213/201-5900)
Directory/1/6-Page Ads: Niki Stranz
Advertising Services Manager: Ray Petsche
Assistant to the Director: Loretta Giglione

Circulation
Director: Penny Ertelt
Director Single-Copy Sales: George Clark
Subscription Manager: Gail Egbert
Single-Copy Sales: Bill Cox
Fulfillment Coordinator: Phil Semler
Promotion Coordinator: Doug Norde

Administration
Director: Janet McGinnis
Accounting: Pat Murphy
Facilities: Joseph Wollenweber
Personnel: Shelly Ginenthal
Technical: Nancy Canning
Assistant to the President: Christina W. Spence

Corporate
PC World Communications, Inc.

David Bunnell
Chairman

Bartlett R. Rhoades
President & CEO

Herbert Linden
Vice President

James E. Martin
Vice President

Jacqueline Poitier
Vice President

Cheryl Woodard
Vice President

Andrew Fluegelman
1943-1985
Founding Editor

May 1986
Volume 3, Number 5
Macworld™ (ISSN 0741-8647) is published monthly by PC World Communications, Inc., 555 De Haro St., San Francisco, CA 94107. Subscription rates are $30 for 12 issues, $50 for 24 issues, and $70 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add $6 per year from Canada and Mexico; add $12 per year for surface mail or $80 per year for airmail from all other countries. For subscriber service questions call toll-free 800/525-0643 (in Colorado 303/447-9330) or write: Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529. To place new orders, call 800/972-3100 (in Nebraska 402/895-7284). Second-class postage paid at San Francisco. POSTMASTER: Send address changes to *Macworld*, P.O. Box 54529, Boulder, CO 80323-4529.
Editorial and business offices: 555 De Haro St., San Francisco, CA 94107, 415/861-3861.
Macworld is a publication of PC World Communications, Inc.

Macworld is an independent journal, not affiliated in any way with Apple Computer, Inc.
Apple is a registered trademark of Apple Computer, Inc. Macintosh is a trademark licensed to Apple Computer, Inc. The following are trademarks of PC World Communications, Inc.: Note Pad, Macware Reviews, Open Window, Macworld Gallery, Macware News, Macworld View.

Printed in the United States of America.
Copyright ©1986 PC World Communications, Inc.
All rights reserved.

READYSETGO™: The 1-2-3™ of Electronic Publishing.

Spreadsheets revolutionized number crunching. READYSETGO is doing the same for electronic publishing.

Its unique block design—a familiar spreadsheet concept—puts the power of professional document production where it belongs: at your desk. If you've ever produced a newsletter, brochure, ad or manual you'll appreciate the way READYSETGO reduces the tedium of document production—while saving you time and money.

1 Entering copy and graphics.

After creating a text block, you enter copy using READYSETGO's built-in editor or by importing text from any Macintosh™ program.

READYSETGO's powerful document editor makes text input a breeze. A self-contained desktop publisher, READYSETGO features a wide selection of professional typefaces, multiple font sizes and variable line spacing. And you may flow text over 40 page documents.

READYSETGO handles graphics just as easily. Create a picture block and paste in any image from the Scrapbook or Clipboard. Advanced graphics editing allows you to scale and crop graphics to suit your document's layout.

2 Designing the document.

READYSETGO does not restrict document design—you can change the appearance or contents of the page at any time. Block placement is flexible, yet can be specified very precisely.

The ease of READYSETGO's *what-if* design style inspires creativity. But you don't have to be an art director to achieve remarkable results. Artistic decisions come to life instantly—and the screen displays exactly what you'll print out.

READYSETGO is not cluttered by scroll bars, so you see more of your design. An exclusive new feature lets you scroll documents quickly—even *diagonally.*

3 Printing.

Once designed, you can print your document using the LaserWriter™, ImageWriter™, or any PostScript™ printer. For extra high resolution, READYSETGO documents can be produced on Allied's Linotron® series typesetters.

Now READYSETGO offers a professional solution for all your printing and publishing needs that's as easy as 1-2-3.

New! Specifications Version 2.1

Editor
Typefaces: *all Adobe fonts**
Point Sizes: *1-99*
Document Size: *1-40 pages**
Variable Tabs: *5 with full editing support**
Indents: *paragraph, left*
Scrolling: *up, down, left, right, diagonally; by page or article/block**
Text Flow: *reflow, vacuum*
Line Spacing: *1, 1½, 2 or by any point size**

Blocks
Maximum: *100 (page); 1,000 (document)**
Frame Styles: *square, oval or circle*
Solid Block Shades: *4*
Lines: *solid, broken or hairlines*
Manipulation: *insert, delete, duplicate, move or clear**
Placement Accuracy: *1/10,000"**
Graphics Scaling/Cropping: *1-999%**
Print Preview: *single page or facing pages*

General
Copy Protection: *none**
Output: *LaserWriter, ImageWriter, Linotron 101/P or 300 or any PostScript device**
System Requirements: *512K Macintosh, Macintosh Plus*
Price: *$195.00*

**Advanced feature*

A versatile document editor supports all your text and graphic needs; variable typefaces and fonts (on the same line), infinitely variable leading, multiple text columns, left and right justification, reverse-outs, tabs, hairline rules, boxes, shading, scaling, cropping, etc.

Money Back Guarantee: Purchase READYSETGO directly from Manhattan Graphics and get a 30-day money back guarantee.

To order READYSETGO call (212) 989-6442, or send a check for $200 (includes $5 shipping and handling) to:

Manhattan Graphics
163 Varick Street
New York, NY 10013

Name _____
Company _____
Address _____
City _____
State _____ Zip _____
☐Amex ☐Mastercard ☐Visa ☐Check
Charge card # _____
Expiration date _____
Signature _____
(NY residents please add 8.25% sales tax)

READYSETGO
The Ultimate Page Processor.

PostScript is a trademark of Adobe Systems, Inc. Linotron is a registered trademark of Allied Corp. LaserWriter and ImageWriter are trademarks of Apple Computer, Inc. Macintosh is a trademark licensed to Apple Computer. 1-2-3 is a trademark of Lotus Development Corp. READYSETGO and The Ultimate Page Processor are trademarks of Manhattan Graphics Corp. ClickArt is a trademark of T/Maker Company

Circle 2 on reader service card

OverVUE. Best Database of the Year.

Choosing a database manager is no easy task. It's by far the most confusing and fiercely competitive field in Mac software. But now your buying decision is crystal clear, because the editors of MacUser and the readers of MACazine have both selected OverVUE as the Best Database of the Year.

Said MacUser (Jan. 1986), in selecting OverVUE for its **Editors Choice Award:** "OverVUE 2.0 is a deceiving program in that the more you use it, the more you realize what it can do. Power, speed and logical menus make this a dream database."

When MACazine (Jan. 1986) bestowed OverVUE with its **Readers' Choice Award,** they wrote: "We selected OverVUE because of its ease of use, clairvoyance and statistical capabilities. The fact that OverVUE was subsequently selected by our readers as Best Database simply confirms our original assessment: the product is a jewel and the customer support a bonus!"

OverVUE's clean sweep of these two prestigious awards only confirms what everyone else has been saying all along:

Infoworld (July 8, 1985): "...it is Macintosh software done right."

Icon Review (Fall 1985): "OverVUE 2.0 is our favorite database workhorse ... it simply offers the best balance of power and ease-of-use available on the market today."

Nibble Mac (Oct. 1985): "OverVUE is not only easy to set up, it's the easiest for data entry. Its tools for entering repetitive data minimizes typing time."

Online Today (electronic version — Nov. 1985): OverVUE 2.0 is a heavy-duty data management tool ... It does all the things a good relational database manager should."

OverVUE's features and power make it the ultimate database choice. Clearly, users and editors alike think OverVUE is something special. We think you will, too.

So visit your nearest software dealer and purchase your very own copy of OverVUE, the Best Database of the Year.

Write for information concerning our new Mail Management and Personal Finance Templates.

ProVUE Development Corp.
222 22nd Street • Huntington Beach, CA 92648 • 714/969-2431

Circle 77 on reader service card

Macworld is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the group include Argentina: *Computerworld/Argentina;* Asia: *Asian Computerworld;* Australia: *Computerworld Australia, Australian PC World, Macworld;* Brazil: *DataNews, PC Mundo;* China: *China Computerworld, China Computerworld Monthly;* Denmark: *Computerworld/Danmark, PC World, Run* (Commodore); Finland: *Mikro;* France: *Le Monde Informatique, Golden* (Apple), *OPC* (IBM), *Theoreme, Distributique;* Germany: *Computerwoche, Infowelt, PC Welt, Computer Business, Run;* Italy: *Computerworld Italia, PC Magazine;* Japan: *Computerworld Japan;* Mexico: *Computerworld/Mexico;* Netherlands: *Computerworld Netherlands, PC World;* Norway: *Computerworld Norge, PC Mikrodata;* Spain: *Computerworld/España, PC World, Commodore World;* Sweden: *ComputerSweden, MikroDatorn, Svenska PC World;* United Kingdom: *Computer News, PC Business World, Computer Business;* Venezuela: *Computerworld Venezuela;* United States: *Amiga World, Computerworld, inCider, InfoWorld, Macworld, Micro Marketworld, PC World, Run, 73 Magazine, 80 Micro, Focus Publications, On Communications.*

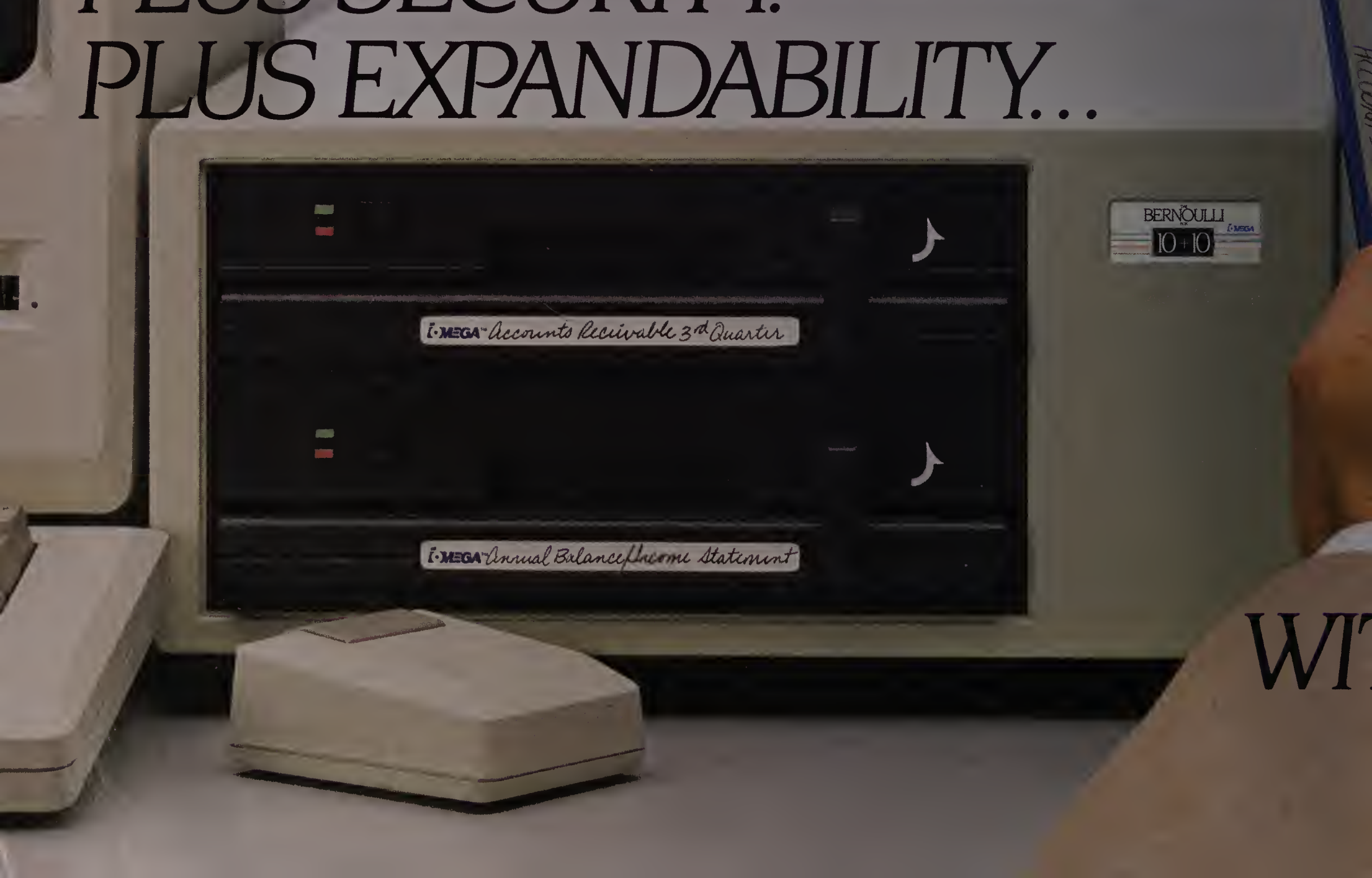
A PUBLICATION OF CW COMMUNICATIONS

Maxell Corp. of America, 60 Oxford Drive, Moonachie, NJ 07074

maxell®
FLOPPY DISKS
THE GOLD STANDARD

Circle 267 on reader service card

"YOU GET MASS STORAGE. PLUS LIGHTNING SPEED. PLUS WORKING BACKUP. PLUS BOOTABILITY. PLUS RELIABILITY. PLUS TRANSPORTABILITY. PLUS SECURITY. PLUS EXPANDABILITY...



WI

INTRODUCING THE EXPANDED, MORE POWERFUL BERNOULLI BOX FAMILY FOR THE MACINTOSH PLUS.

"With its incredible speed, we're free to do other, more important things with our time."

"With identical copy backup, we're free from the hassles of restoring data to the disk drive when we need it. It's always available."

"With its unsurpassed reliability, we're free from worries about head crashes and lost data."

"With its rugged, removable cartridges, we're free to work in a more flexible, task-oriented fashion, to take or mail data across country, to expand without the hardware expense, and to lock data up for total security."

These are the things that satisfied users of The Bernoulli Box have been proclaiming for years. Now, with the changes Apple has built into the Macintosh Plus, The Bernoulli Box delivers add-on performance never before possible.

Speed no other mass storage device—inside, beside or underneath—has ever achieved. Immediately usable, identical copy backup. Fast, simple booting. And unparalleled versatility. The cartridges store and ship easily. They can be locked up for security. And when you need to add capacity, you add inexpensive cartridges, not expensive hardware.

Available in single and dual drive versions, and with either 5-, 10- or 20-megabyte cartridges, these new Bernoulli Boxes offer up to 40 megabytes of online capacity. And they join a popular family of Mac products that includes the original 5-megabyte, single-drive Bernoulli Box and our Network Server,™ still the most functional data storage component for AppleTalk.™

The new Bernoulli Boxes for the Macintosh Plus. They deliver an unbeatable combination of plusses. Speed. Backup. Bootability. Reliability. Transportability. Security. And expandability. For more information on how to better manage your information, see your local dealer or call (800) 556-1234 ext. 215. In California, call (800) 441-2345 ext. 215.

IOMEGA®

IOMEGA CORPORATION, 1821 W. 4000 South, Roy, Utah 84067

Ask Your Dealer About The Free Data Double-Up.

H THE NEW BERNOULLI BOX® FOR THE MACINTOSH PLUS.™"

Circle 171 on reader service card

MichTron
SCORE
DIGITAL RESEARCH
PRINTER
B:\PRINTER\
57904 bytes used in 8 it
BATTERIES INCLUDED
EPYX
MIGRAPH
CLIPBOARD
TRASH
ATARI
SIERRA
Brute
ACTIVISION
52
615
VIVACE
ATARI
subLOGIC
COMPASS
FUEL
OMI
RPM
COM
TIME
NAV 1
DME
NAV 2
ADF
OFF
ATARI
HELP
Item 20
Description
Current Value
Date Acquired
Classification
Condition 5
SPINNAKER
and in walks Della,
smiling mysteriously.
"Looks to me like you had
yourself a female visitor
last night, Perry.
Entertaining a new
client?"
INFOCOM
You have:
no tea
a loose pile of junk mail
a toothbrush
a flathead screwdriver
your gown (being worn)
It looks like your gown contains:
pocket fluff
The vast yellow ships thunder across the sky, spreading waves of terror and
panic in their wake. The voice of the Vogon Captain slams across the country,

THE ST COMPUTER LINE FROM ATARI.

IT'S ALREADY KNOWN BY THE COMPANY IT KEEPS.

It's only natural that the hottest new computers in America are attracting the hottest software companies in the business.

The library of innovative business, education, entertainment, system management, and integrated package software for the 520ST™ and the new 1040ST™ is already impressive, with literally dozens of new programs being introduced almost every week.

In fact, the software companies who are committing their time, money, and expertise to the ST are the same companies who regularly show up on all the software hit lists.

And it's no wonder that the leading software developers are excited by the power and speed of the ST Computers.

Stoneware®, for example, checked out the speed of the ST Disk Drive in data base applications and flipped. Instead of having to wait forever to manipulate data, thousands of records can be sorted in a fraction of the time that it takes on other computers. And instant responsiveness is the name of the game, not waiting.

Sierra On-Line®, on the other hand, took one look at our incredible high speed, high resolution graphics and was ecstatic. The result is a whole series of games that are more realistic and lifelike than ever before.

For their needs, Activision® focused on the built-in MIDI ports for attaching synthesizers and other musical instruments. This enabled them to design the ultimate program for playing and composing music.

The list goes on and on. But a designer for Spinnaker® perhaps summed up the capabilities of the 520ST and the new 1040ST best:

"I feel like a painter," he said, "who at last has a canvas large enough to let my creativity run free."

So if you're looking for a computer system that combines the very best in software with the very best in hardware at the very best price . . . you're looking for an ST from Atari.

ATARI®

Circle 370 on reader service card

It's alive!

The Human Touch comes to Macintosh.® It's called the Three to One Touch Board,™ and in the ten minutes it takes your dealer to install it, the Three to One Touch Board will revolutionize your Apple Macintosh.

Start with Speed. By increasing the Macintosh's 8 Mhz. processing speed to 12.5 Mhz., the Three to One Touch Board more than doubles your processing speed. This means that you will now be able to load and operate up to eight programs using Apple's Switcher™ in a fraction of the time it would otherwise take.

On to Memory. Through the addition of 1.5 megabytes of RAM, the Three to One Touch Board actually quadruples your Macintosh's workload capability. The Three to One Touch Board works just as well with your 128 K or 512 K Macintosh. By making all data storage contiguous, your computer works a whole lot harder because it works a whole lot more of the time.

Next, there's expandability. The Three to One Touch Board makes an additional 384 K of ROM space available to you. Look for popular software packages, resident in ROM, available from Human Touch shortly.* Also, the Three to One Touch Board contains expansion capabilities that allow access to the microprocessor bus. The card cage and case adaptor will be available from Human Touch soon.

Don't forget ease of installation. The Three to One Touch Board opens the Macintosh architecture without the need to solder, wire, or alter the inside of your Macintosh in any way. Tell your dealer to give us a call for further information.

Finally, there's action. This is the only part of the Three to One Touch Board program we've left up to you. Get on board . . . when it comes to your Macintosh, the Three to One Touch Board gives a whole new meaning to being alive.

Three to One
TOUCH™ BOARD

human touch™

Human Touch Computer Products Corporation • 401 Rt. 70 East • Suite 200 • Cherry Hill, NJ 08034 • 609-429-6300

* Software Developer: Please contact Human Touch Computer Products if you would like to participate.

Macintosh is a trademark licensed to Apple Computer, Inc. Switcher is a trademark of Apple Computer, Inc.

Circle 434 on reader service card

David Bunnell

Personal Computer Games Come of Age

A new genre of computer play mimics the real world, exercising the mind and not just the mouse

Ultimately, computer games will change the way we think about thinking.

Conventional wisdom in the personal computer industry says that the potential of home computers will not be realized until some truly practical and desirable application comes along. Electronic shopping and control of household appliances are often cited as the breakthroughs that will someday send hordes of new customers to the computer stores.

But I believe that it will be entertainment, not utility, that makes the home computer a standard household item.

I'm not referring to multitasking, RAM-resident utilities, networking, artificial intelligence, databases, or even cursor keys that glow in the dark.

No, I'm thinking about something that happens to have many more implications for humanity's mental health: computer games.

In the final analysis, computer games will prove to be the deciding factor that puts computers in every home. Fun—not functionality—will be the key.

Ultimately, computer games will change not only the way we view the world—they will also change the way we think about thinking.

How is that possible?

First of all, I'm not referring to the goofy track 'em, eat 'em, shoot 'em up games played by the game pioneers of olden days.

We've come a long way since then.

Most early games, you may recall, grew out of video games—or, to be precise, out of the mainframe computer game called *Adventure*.

In *Adventure* you traveled along a branching path, looking left and right, and made decisions about which direction to take. You also had to pick up certain objects along the way, such as a lantern and a knife. Eventually, you crossed a stream and came to a cave.

Waiting inside the cave was a dragon you could slay only if you managed to light the lantern and grasp the knife.

Adventure was the great-granddaddy of today's interactive adventure games for personal computers. Computer games that originated from video games like *Donkey Kong, Pong,* and *Breakout* largely tested your reflexes and your hand-eye coordination.

One thing computer games didn't do was tax your brain. They were variations on a theme, and after you played them for a while, they became boring.

Because these games were so dull and repetitive, most computer magazines and computer enthusiasts wrote them off as juvenile pastimes. Games weren't seen as particularly meaningful.

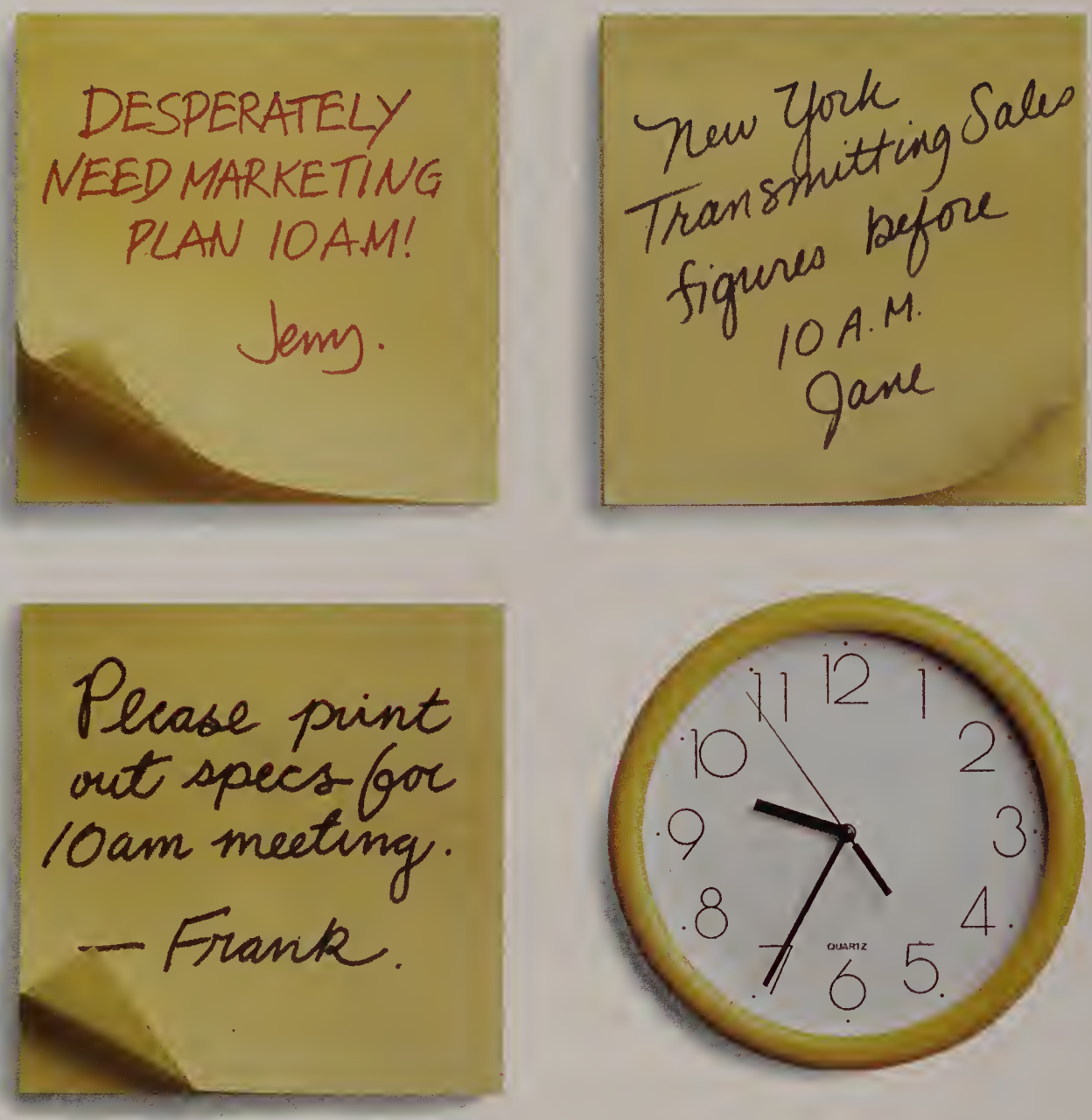
Until now.

With personal computers that are more powerful and have more memory, computer games have changed dramatically. They are becoming exercises for the mind.

I heard about this notion from Trip Hawkins, president of Electronic Arts, a company that specializes in home computer games. Trip spoke at a computer conference recently about the brain's Use It or Lose It syndrome. He made the interesting observation that from the seventies on, physical exercise has been an important part of people's lives. More and more people today jog, swim, use Nautilus equipment, and engage in various other physical activities.

(continues on page 16)

Only the Hayes® Transet 1000® can get you out of this one.



©1986 Hayes Microcomputer Products, Inc.

Now your PC can do three things at once instead of making you wait while it does one thing at once.

We call it *triple tasking*.°

It means you can work with your PC while the Transet 1000 receives your electronic mail and runs your printer for you simultaneously.

Three jobs at once. No waiting.

When you're away from your desk, or at night while your PC is turned off, Transet 1000 serves as an electronic mailbox. Because it has its own independent 128K or 512K memory.

To get the messages that come in through the night, you can call them up on your PC. Access them through a remote modem if you're away from the office. Or even have them waiting for you in hard copy.

By now it's dawning on you that Transet 1000 can make your PC about three times as productive as it is now. Which is no small statement.

You've also figured out it's more than just a print buffer. More than just a communications buffer. And probably costs a lot. Right?

Wrong!

It costs only $399* for the 128K model which stores up to 90 pages. And only $549* for the 512K version with up to 360 pages of storage.

For more information and specifications, contact your authorized Hayes dealer. Or Hayes directly at (404) 441-1617.

Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, Georgia 30348.

Hayes®

Say yes to the future with Hayes.

*Manufacturer's estimated retail price.

Circle 257 on reader service card

Meet The Perfect Companion For Dinner At Eight.™

THE
SILVER PALATE™
C·O·L·L·E·C·T·I·O·N

If you enjoyed browsing through recipes from America's finest restaurants, you'll love spending time with The Silver Palate Collection, compiled from the renowned Silver Palate Cookbook© by Julee Rosso and Sheila Lukins.

This easy-to-use add-on disk for the bestselling Dinner at Eight program enables you to turn an everyday meal into a deliciously memorable occasion as you speedsearch recipes from either collection, combine shopping lists, and coordinate cooking times for everything from a single serving to an elaborate feast.

Now both programs are available in a special package deal from Rubicon Publishing. Call today for the delectable details!

For more information, call 1-800-MAC-2210
6300 LaCalma Drive, Suite 100, Austin, Texas 78752, 512/454-5004

The Silver Palate Collection is a trademark of Julee Rosso and Sheila Lukins licensed to Rubicon Publishing. Dinner at Eight is a trademark of Rubicon Publishing. The Silver Palate Cookbook copyright 1982 by Julee Rosso and Sheila Lukins.

RUBICON
PUBLISHING

(continued from page 13)

But so far we're exercising just the body and ignoring the mind.

Trip believes that soon we'll discover it's equally important to exercise our gray matter. With practice, we'll be sharper mentally, have a better memory, and in general prolong our intellectual alertness as well as delay the mental effects of aging.

What health food is to the body, computer game software will be to the mind.

In fact, personal computer games could be the most engaging and beneficial form of mind exercise. Today, some people do the Sunday *New York Times* crossword puzzle, and some people play chess. These are mental exercises, of course. But the computer gives us the potential to enjoy a much greater variety of mental exercises with far more applications.

I've recently found two examples of games that flex the brain. There are many others, and there will be many more in the future, but both these games are excellent tools for developing awareness. They are also extremely educational.

One is Mindscape's *Balance of Power* for the Macintosh, and the other is Reality Development's *Business Simulator* for the IBM PC.

I think that the theme of *Business Simulator* reflects the fact that the IBM PC is a business-oriented machine for the corporate world, while the global quality of *Balance of Power* is more in line with the attitudes represented by Apple's Macintosh.

With *Business Simulator* you start your own company. You're in the robotics industry, you have $500,000 in seed money and access to robotics technology—and you're competing against Apple, Hewlett-Packard, Tandy, and Texas Instruments.

As you play the game, you need to make all kinds of choices—like what your prices should be, how many units you should build up in inventory, and how much you should spend on advertising. After you've made the choices, you run the program. It goes through an entire year's projections. Depending on your choices and the preprogrammed decisions of the other companies, the program determines your market share and how successful you'll be.

The game becomes more complex as you go from one level to another. For example, on a higher level you have to introduce new products into the market. There's a pet robot, then a security robot, a home robot, and other consumer products. You must decide how much money to spend on R&D. You're concerned about return on equity, about raising venture capital and building new factories. And you have to decide when to go public.

It's really like a Harvard MBA course on a disk.

Of course, the game is not real life, but you do learn many valuable concepts about doing business. As I became more involved in playing it, I began to dream at night about what kind of robots I was planning to build and what my fictional company was doing.

In fact, the game became so consuming that I spent more free time thinking about *Business Simulator* than I did about my real job at PC World Communications.

In *Balance of Power,* you find yourself playing the role of the United States or the Soviet Union. The purpose is to create a global strategy. The impact of your moves can put the whole world in jeopardy, especially since you could easily cause a nuclear conflagration.

(continues on page 18)

NEON:™ TURN ON THE FULL POWER OF YOUR MACINTOSH.™

THIS MESSAGE IS FOR BEGINNING PROGRAMMERS, TOO!

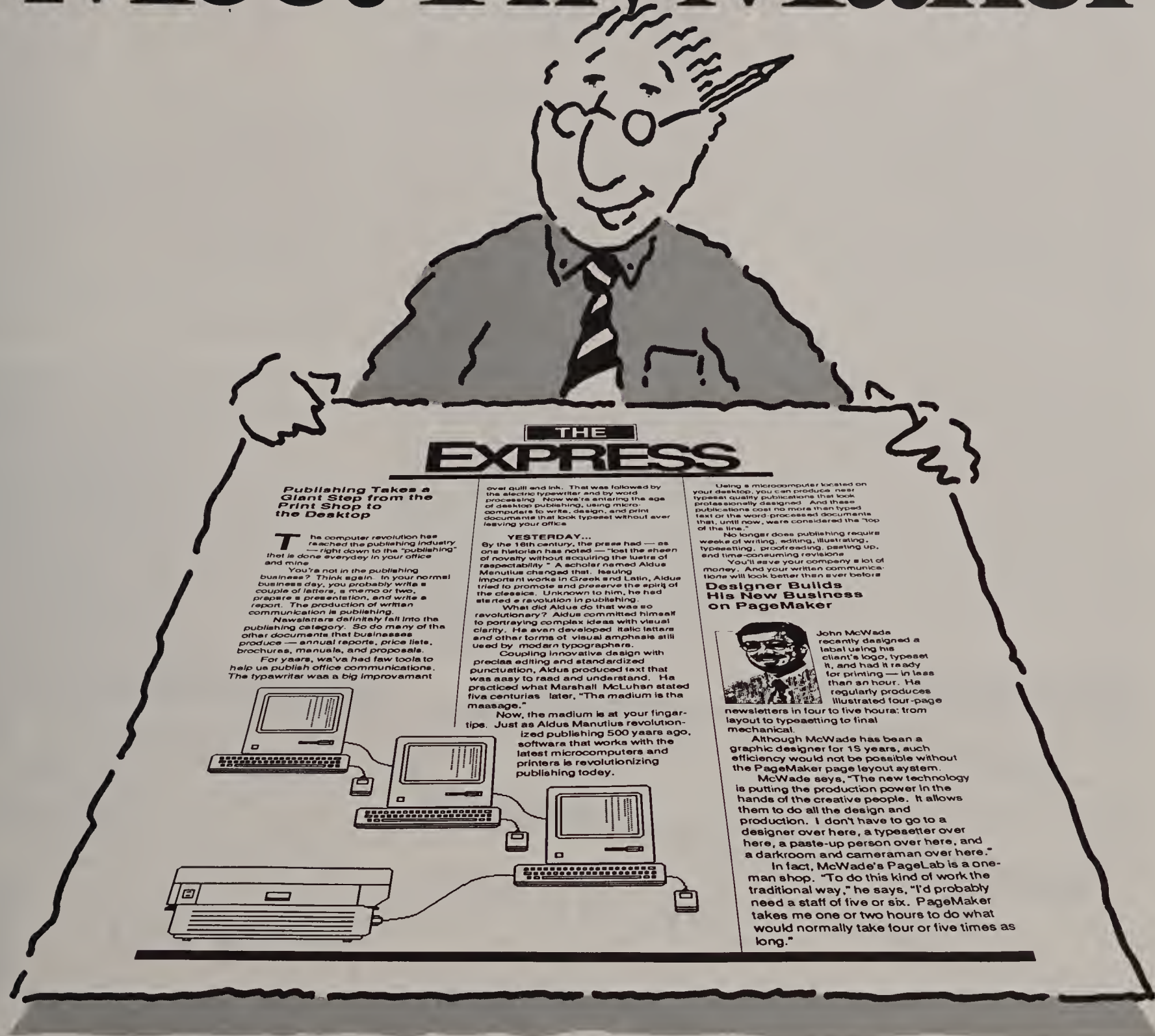
Hidden within your Mac is the programming power, flexibility, and speed to match your imagination. Neon is your key to this object-oriented world. Based on the same design philosophy as the Mac itself, Neon lets you create and command objects — program modules that you build, perfect, and add to your personal collection of tools. In this Smalltalk-like environment, you wield the power to quickly assemble and test ideas, tuning as you go for maximum speed and efficiency. ☐ Neon now includes full floating point support. An integrated Neon Assembler is also available as an add-on product. ☐ Neon is easy to work with and comes with a comprehensive manual by Danny Goodman. ☐ Created by Kriya Systems, Inc. for the development of our Typing Tutor III™ program, Neon is your answer for professional software development. With Neon, there are no licensing fees. Ever. For the MacIntosh developer, Neon is the best choice.

To choose, call 1-800-34-**KRIYA** (In Virginia, 703-430-8800) with Visa/MC. Or Write Kriya Systems, Inc., Six Export Drive, Sterling, VA 22170. Neon, $195; Neon Assembler, $50. Add $5 shipping for each.

Neon and Typing Tutor III are trademarks of Kriya Systems, Inc. Apple Macintosh is a trademark of Apple Computers, Inc.

Circle 246 on reader service card

Meet Thy Maker



THE EXPRESS

Publishing Takes a Giant Step from the Print Shop to the Desktop

The computer revolution has reached the publishing industry — right down to the "publishing" that is done everyday in your office and mine.

You're not in the publishing business? Think again. In your normal business day, you probably write a couple of letters, a memo or two, prepare a presentation, and write a report. The production of written communication is publishing.

Newsletters definitely fall into the publishing category. So do many of the other documents that businesses produce — annual reports, price lists, brochures, manuals, and proposals.

For years, we've had few tools to help us publish office communications. The typewriter was a big improvement over quill and ink. That was followed by the electric typewriter and by word processing. Now we're entering the age of desktop publishing, using microcomputers to write, design, and print documents that look typeset without ever leaving your office.

YESTERDAY...

By the 16th century, the press had — as one historian has noted — "lost the sheen of novelty without acquiring the lustre of respectability." A scholar named Aldus Manutius changed that. Issuing important works in Greek and Latin, Aldus tried to promote and preserve the spirit of the classics. Unknown to him, he had started a revolution in publishing.

What did Aldus do that was so revolutionary? Aldus committed himself to portraying complex ideas with visual clarity. He even developed italic letters and other forms of visual emphasis still used by modern typographers.

Coupling innovative design with precise editing and standardized punctuation, Aldus produced text that was easy to read and understand. He practiced what Marshall McLuhan stated five centuries later, "The medium is the message."

Now, the medium is at your fingertips. Just as Aldus Manutius revolutionized publishing 500 years ago, software that works with the latest microcomputers and printers is revolutionizing publishing today.

Using a microcomputer located on your desktop, you can produce near typeset quality publications that look professionally designed. And these publications cost no more than typed text or the word-processed documents that, until now, were considered the "top of the line."

No longer does publishing require weeks of writing, editing, illustrating, typesetting, proofreading, pasting up, and time-consuming revisions.

You'll save your company a lot of money. And your written communications will look better than ever before.

Designer Builds His New Business on PageMaker

John McWade recently designed a label using his client's logo, typeset it, and had it ready for printing — in less than an hour. He regularly produces illustrated four-page newsletters in four to five hours: from layout to typesetting to final mechanical.

Although McWade has been a graphic designer for 15 years, such efficiency would not be possible without the PageMaker page layout system.

McWade says, "The new technology is putting the production power in the hands of the creative people. It allows them to do all the design and production. I don't have to go to a designer over here, a typesetter over here, a paste-up person over here, and a darkroom and cameraman over here."

In fact, McWade's PageLab is a one-man shop. "To do this kind of work the traditional way," he says, "I'd probably need a staff of five or six. PageMaker takes me one or two hours to do what would normally take four or five times as long."

PageMaker™, the remarkable page layout software program, brings the capability of a dedicated publishing system to the personal computer for the first time. You can now produce high-quality business communications such as newsletters, data sheets and price lists in your own office.

Combining PageMaker with a Macintosh Computer and LaserWriter creates a powerful desktop publishing system. It so substantially reduces the time and money you spend on publications, the system pays for itself in less than one year. PageMaker eliminates the need to spec, order, wait and pay for type, illustrations and photostats. It gives you the ability to prepare and print your publications within hours rather than days or weeks.

It's time you met your PageMaker. For more information, contact Aldus Corporation at 1-800-824-4000, ext. 674.

PageMaker

Aldus Corporation
616 First Avenue, Suite 400
Seattle, Washington 98104

*PageMaker is a trademark of Aldus Corporation. Apple® is a trademark of Apple Computer, Inc. MacintoshTM is a trademark licensed to Apple Computer, Inc.
©1985, Aldus Corporation

Circle 306 on reader service card

(continued from page 16)

Just as with *Business Simulator,* you become completely involved, so when you accidentally blow up the world, you actually feel depressed.

As a consequence, you are determined to be more careful when you start up a new game. You come to appreciate the implications of each action, and you learn some of the complexities of international diplomacy. The game has four levels—Beginner, Intermediate, Expert, and finally, Nightmare.

As you play, you make decisions about whether you should support the use of force in a particular country or attempt a coup d'état and assume leadership. If so, how will the other superpower respond to your moves? What are the implications?

A decision that is a good strategy in one case might prove to be disastrous in another. The goal of the game is to gain more prestige than your rival without blowing up the world.

These two games are examples of how the computer game has come of age. I think that all computer users will pay more attention to games from now on.

And I predict that games will usher in a new era of fitness aimed at developing and strengthening the mind—firming up gray matter that has become flabby from lack of strategic exercise.

There could be all kinds of *Business Simulators.* In fact, just as the early computer game *Adventure* came to us from the mainframe world, today's genre of so-called reality software is also taken from mainframe computing.

For some time now, programmers have been developing business simulations on mainframes for specific companies like IBM and AT&T. So, for example, instead of playing with a robotics company, I could have a magazine publishing company. I could program my personal computer with all the characteristics of different computer magazines, and in doing so I would be creating a real-life simulation of my own business. Eventually anyone could have a custom-designed simulation.

This is where computer games are heading. As personal computers continue to gain memory and horsepower, you'll see more levels of simulation that truly relate to your life—both personally and professionally.

It's been a long time coming, but computer games are no longer going to be considered an unimportant by-product of computer technology—just something for kids to do when they want to vegetate electronically.

The games are going to be much more serious than that. Two or three years from now, computer games will be *the* thing.

When you add CD ROM technology to computer games, they're going to break through all kinds of mental barriers. That breakthrough will herald the golden age of computing, the information renaissance.

Just think about it. Radio, television, stereo—all these major advances in human communications met popular acceptance through the entertainment world.

It's always entertainment first, education second.

And with this new generation of computer games, we will see the distinction between entertainment and education disappear completely.

They will become one and the same. □

A mistake in the April column rewrote Philippe Kahn's life story; actually he never worked at Xerox.

Fluent Laser Fonts™
Casady Company

A growing collection of typefaces in PostScript™ for use on the LaserWriter™ and compatible printers. Complete with screen fonts and downloading program. Use with PageMaker and all other programs.

SansSerif MONTEREY
MICRO Regency Script BODONI
Calligraphy RIGHT BANK RITZ
PREMIERE Cyrillic PreludeScript PLAZA

To Order Call (800) 851-1986 - In Calif. (800) 331-4321
For Information Call (408) 646-4660

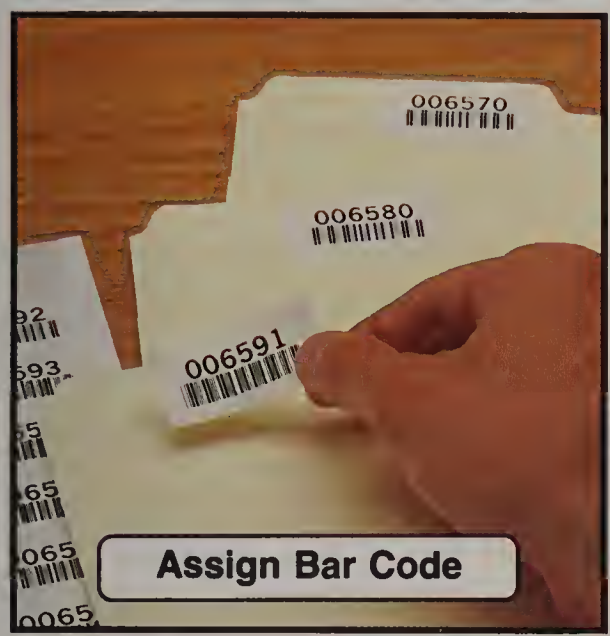
Casady Company
P. O. Box 223779 • Carmel, CA 93922

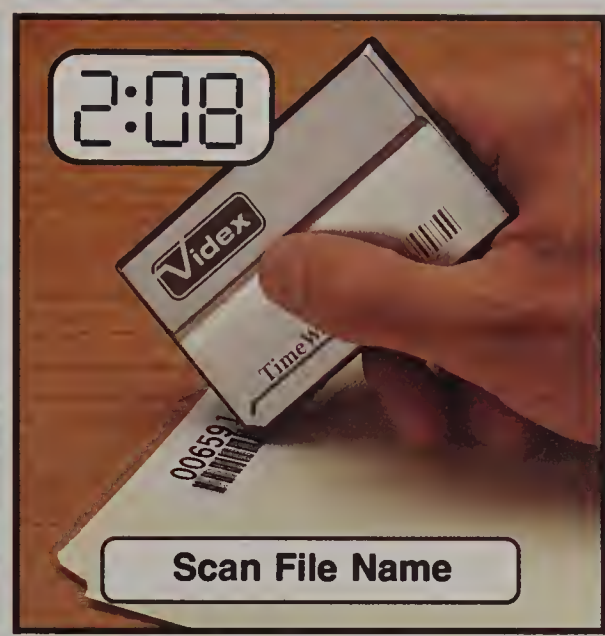
TWO-DISK SET OF QUALITY BITMAP FONTS FOR USE ON THE IMAGEWRITER. 48 STYLES INCLUDING TEXT, GRAPHICS, TECHNICAL SYMBOLS, IMAGES, & EXTENSIVE SUPPORT OF FOREIGN LANGUAGES.

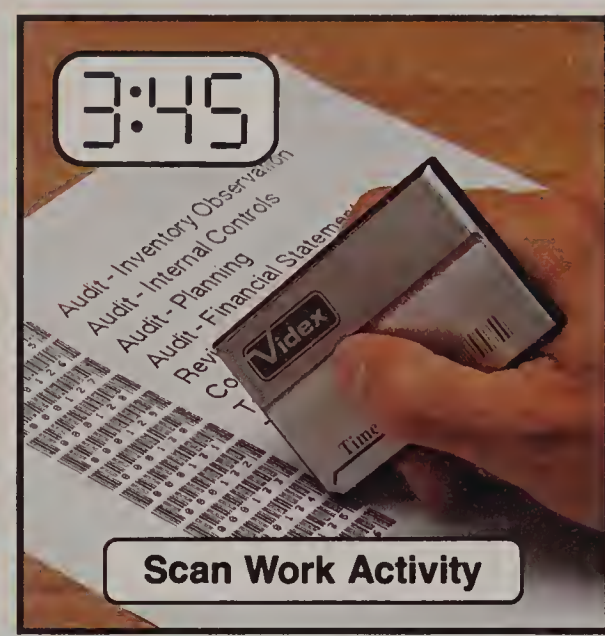
FLUENT FONTS™
For the Macintosh™

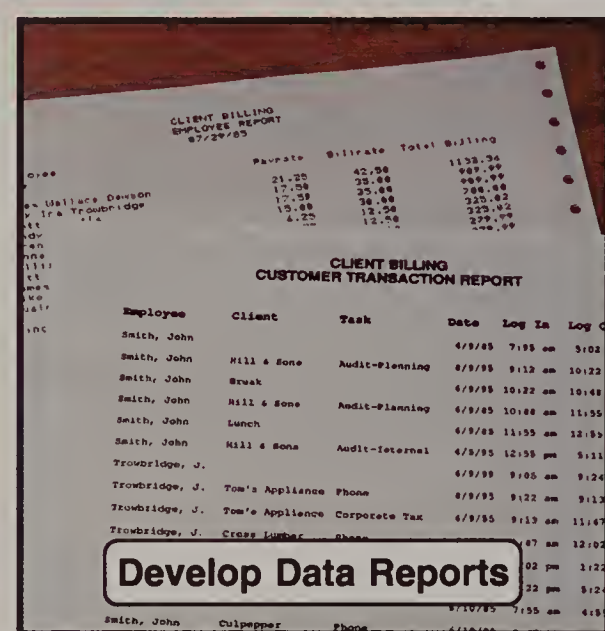
TRADEMARKS: Fluent Fonts, Fluent Laser Fonts-Casady Company; Macintosh, LaserWriter, ImageWriter-Apple Computer, Inc.; PostScript-Adobe Systems, Inc.; PageMaker-Aldus Corp

TimeWand™ - Keeping track of time...









Six easy steps to time management!

The Videx TimeWand™ is an intelligent yet inexpensive bar code system for your business needs. Small enough to fit easily into a shirt pocket and weighing in at less than two ounces, TimeWand gives a new dimension to the concept of fully portable bar code readers.

Versatility is the hallmark of the TimeWand system. With its built-in microprocessor, TimeWand puts the power of a computer into the palm of your hand. Power that lets you actually change how TimeWand works. Whether you want to read different types of bar codes or program the wand to read bar codes in a certain order, TimeWand can accommodate your needs.

Available in three different memory configurations, TimeWand can store from 2,000 to 16,000 characters in its internal memory. This means you can hold from a few hundred to a few thousand bar codes in the TimeWand before transferring the information to a host computer system.

TimeWand time-stamps *each* bar code as it's read. This lets you know not only what the bar code says, but *when* the code was read.

The TimeWand's recharging/download station uses a standard RS232C serial connector that allows you to communicate with the wand through a variety of host computer systems. Since the communication is keyless, the scan information is sent quickly and error free. Currently, software packages are available for the IBM PC (and compatibles), Apple //, and Apple Macintosh personal computers.

Put the power of TimeWand in your own hands... and let it work for you.

TimeWand (2K version) - **$198**
Recharger - $149
TimeWand Manager Software (Macintosh) - **$499**
TimeWand Communications Software (IBM) - **$299**

Videx®

1105 N.E. Circle Blvd., Corvallis, OR 97330
503-758-0521

Videx is a registered trademark and TimeWand is a trademark of Videx, Inc.

Circle 383 on reader service card

Microsoft Excel. For those who

You may speak more softly now.

For we are delivering into the hands of business, a very big stick.

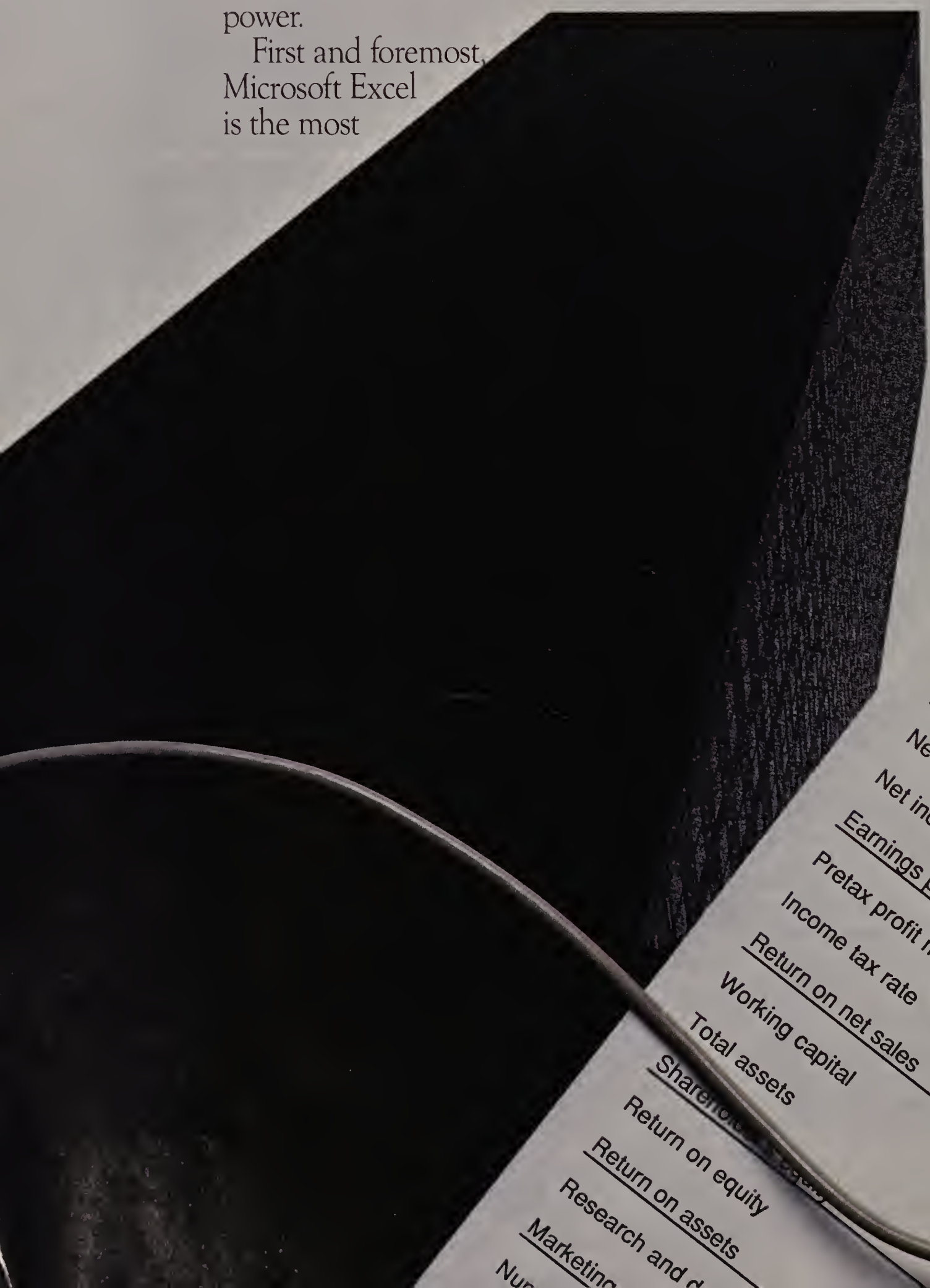
Microsoft® Excel for the Macintosh.™ A financial analysis tool of unprecedented power.

First and foremost, Microsoft Excel is the most formidable spreadsheet ever to run on a personal computer.

A spreadsheet which is in turn linked with an extraordinary graphics program and a highly capable data filing application.

These already considerable powers are magnified geometrically by Macros.

Which give Microsoft Excel



appreciate the uses of power.

the capacity to learn your most complex routines. And activate them with a single keystroke.

Yet for all its ability, Microsoft Excel is simple to learn, simple to use. No complex commands to memorize. No classes to take. The only thing complicated about Microsoft Excel is the problems it can solve.

See your Microsoft dealer for a demonstration of the powers of Microsoft Excel.

In the right hands, a potent weapon, indeed, in the cause of commerce.

We trust you will use it responsibly.

Microsoft Excel

The rest are history.

You can upgrade to Microsoft Excel from Microsoft Multiplan® (Macintosh version) for a suggested retail price of just $200. See any participating Microsoft dealer. For the name of the nearest one, call (800) 426-9400. In Washington State and Alaska, (206) 882-8088. In Canada, call (416) 673-7638. The upgrade offer is good only in the United States and expires on 8/31/86.

Microsoft is a registered trademark of Microsoft Corporation.
Macintosh is a trademark licensed to Apple Computer, Inc.

Don't be overwhelmed

The good news is that virtually all of you who follow these things know that Microsoft® Word is by far the most capable word processor you can run on a Macintosh.™

The too bad news is that some of you think that means you're not qualified for Word.

Well, you don't need to be writing a novel to appreciate the way Word accelerates all the repetitive activities of word processing.

In fact, if you've ever needed to combine information from old files in a new one, or if you've ever had to shut down one file just to look at another—then you're ripe for Word.

Leave the windows open.

For people who've gotten used to the tedium of closing one job before they could open the next, Word's windows are a real eye-opener.

Because this feature—an exclusive, we must add—lets you display four different Word documents on screen at one time. And leap rapidly from one to another, cutting and pasting among them.

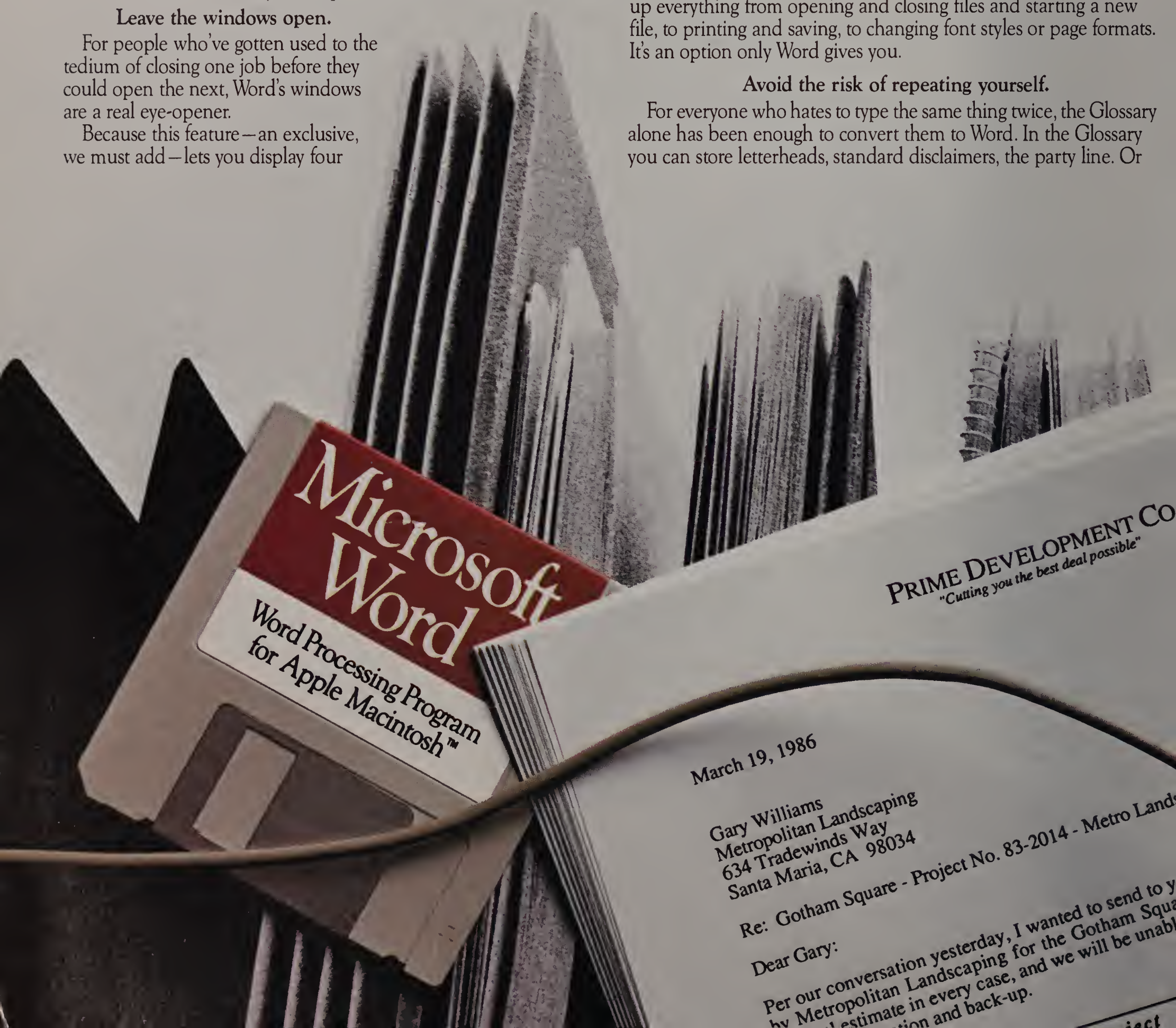
A real time saver, even if you're only composing a memo. If, say, you needed to combine material from your three previous memos into a fourth new one.

The training wheels aren't welded on.

Some things *are* best done with mouse and menus. But once you've worked with a Macintosh for a while, you'll want the option to run commands from the keyboard as well. A faster way to order up everything from opening and closing files and starting a new file, to printing and saving, to changing font styles or page formats. It's an option only Word gives you.

Avoid the risk of repeating yourself.

For everyone who hates to type the same thing twice, the Glossary alone has been enough to convert them to Word. In the Glossary you can store letterheads, standard disclaimers, the party line. Or



by superiority.

mumbo jumbo. All can be instantly retrieved with a keystroke.

At the bottom of this ad you'll find trademark info and other legal niceties. Perfect examples of things to keep in your Glossary.

Word won't hold you back.

If you need to do professional quality word processing on the Macintosh, we're pleased to say your choices are limited. To Microsoft Word.

A monopoly you will not mind. Because Word gives you everything your literate heart could desire. Noteworthy being unlimited manuscript length. Just keep writing 'till your disk runs out. Then put in another disk.

Word also runs the most popular letter quality printers. As well as the Apple® LaserWriter. For astonishing results.

In fact, you can astonish everyone you've ever known with Word's exclusive mail merge feature. Which lets you match form letters with address lists. Putting mass mailing in the reach of anyone who seeks a vast audience.

You'll pick up Word fast.

We were smart enough to make Word supremely capable. We weren't going to be dumb and make it hard.

As the designers of more Macintosh applications than anyone else, we give Word the benefit of our unmatched experience. Along with a very comprehensive on-line Help feature. Making Word a very quick study.

And if you should ever have a question you can't work out on your own, our telephone support people will walk you through it.

So before you process another paragraph, test scribe the program from Microsoft. And never be at a loss for Word.

Microsoft® Word

The High Performance Software™

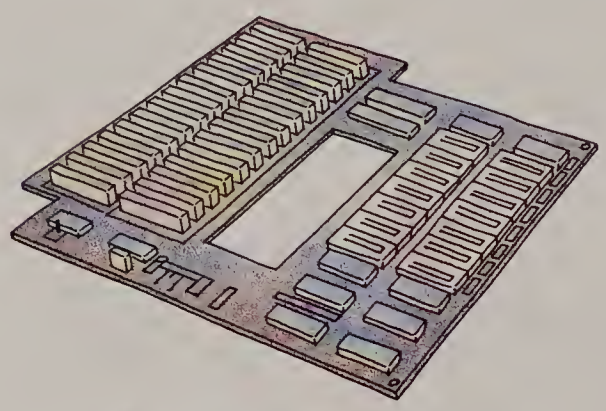
For the name of your nearest Microsoft dealer, call (800) 426-9400. In Washington State and Alaska, (206) 882-8088. In Canada, call (416) 673-7638.

Microsoft is a registered trademark and The High Performance Software is a trademark of Microsoft Corporation. Apple is a registered trademark of Apple Computer, Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. and is used with its express permission.

Free Memory

TheMax2™
for 128K and 512K

TheMax2. With three times more added memory than you get from Apple for about the same price, it's like getting memory free.



• **Have 2 Mb in minutes.** Installation is so easy you can do it yourself.

• **Get contiguous memory** without changing ROMs. With 1.5 Mb contiguous, you're free to handle all your favorite software, even Switcher and Excel.

• **Add the new Apple ROMs** when you're ready, for 2 Mb of contiguous memory, without boot software.

• **Plug in the new megabit chips** for 4 Mb that can handle even the largest programs.

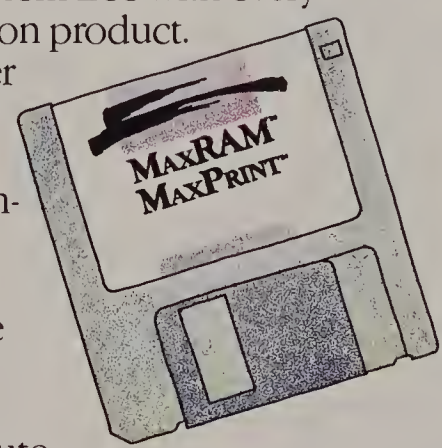
• **Recover easily** if you crash — MaxRAM saves your RAM disk intact to get you going again fast.

• **Get MaxRAM and MaxPrint free** — you'll have more free time.

Circle 337 on reader service card

Free Time
for all Macintosh users

Introducing MaxRAM™ and MaxPrint™ two productivity tools that are so useful we include them free with every Max expansion product. Now, whether you have a 512K, expanded memory, or hard disk system, you can have them, too.



MaxRAM automatically creates an adjustable RAM disk at boot that runs 10 times faster than a floppy disk. Best of all, it autoloads as easily as putting files into a folder, both from hard disks and from multiple floppies.

MaxPrint — the desk accessory that lets you keep on working while you print — even lets you change files and applications. And it spools both text and graphics easily. Use it with expanded memory or hard disk systems — the perfect companion for Apple's HD20.

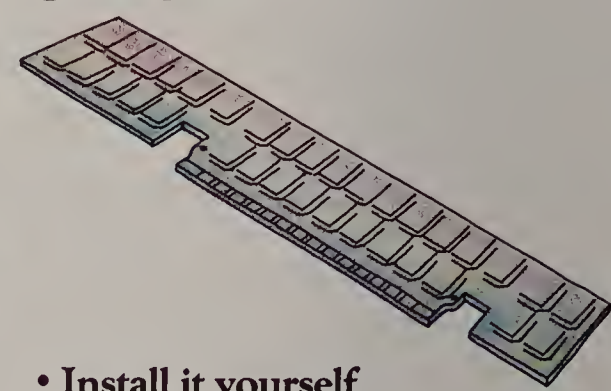
Now, with MaxRAM and MaxPrint, your only problem will be deciding what to do with your free time.

Home Free

Just ask. We'll send you the product of your choice to try for 15 days — free. If all that speed and efficiency isn't right for you, feel free to return your order for a full refund. Want more information? In California, call (408) 773-9922. Outside California, call (800) 862-2636

TheMaxPlus™
for the Macintosh Plus

TheMaxPlus turns your Macintosh Plus into a 2 Mb powerhouse of memory — modular memory to expand with your growing memory needs.



• **Install it yourself in minutes.** Just plug TheMaxPlus into the Macintosh expansions slots provided by Apple.

• **Have more memory free** for handling your largest applications — 2 Mb of linear, contiguous memory that doesn't require boot software or ROM modifications.

• **Feel free to expand** — our modular design lets you plug in a full 4 Mb when you need it, and be ready for other MacMemory plug-in products as well.

• **Get more free time** — free MaxRAM and MaxPrint software let you work 10 times faster than with a floppy — even work and print at the same time. Now you can use your time to do more than just wait.

MacMemory Inc.

473 Macara Ave, Sunnyvale, CA 94086 (408) 773-9922

(800) 8-MAC-MEM

Apple is a trademark of and Macintosh is a trademark licensed to Apple Computer Inc. TheMax, MaxRAM and MaxPrint are trademarks of MacMemory Inc.

Network Static

Until information services are as easy to use as MacPaint, the people who use them will remain a minority.

In spite of these caveats, I still recommend having a modem.

In personal computing the term *networks* refers to the various aspects of telecommunications. Networks are touted in full-spread ads in computer magazines, on modem packages, and in books and breathless articles about the emerging network nation. Networks include information services, common carriers that link personal computers to those utilities, small-scale bulletin boards, conferencing systems, videotex and teletext systems, and, of course, local area networks in the office.

None of these networks lives up to the hyperbolic promises of the last few years. The promises have come mostly from two camps: people whose business is directly related to networks and telecommunications enthusiasts who are to networks what hobbyists were to the first personal computers—brothers and sisters, under the skin, to CBers and stamp collectors. In real terms, networks are not yet ready for most people because of unfriendly user interfaces, an unfavorable cost-to-benefit ratio, the lack of hardware and software standards, and the specter of electronic junk mail.

Despite the great number of how-to books about information services, connecting a personal computer—even the otherwise easy-to-use Macintosh—to information services such as The Source or CompuServe is still time-consuming and frustrating for a beginner. Despite on-line help, tutorials, seminars, and one-to-one instruction sessions, even long-time users have their costly on-line time gobbled up by discovering through trial and error unannounced changes in a system's user interface, command set, or communications protocols. On-line services will not catch on with the general public until they are as easy to use as *MacPaint*.

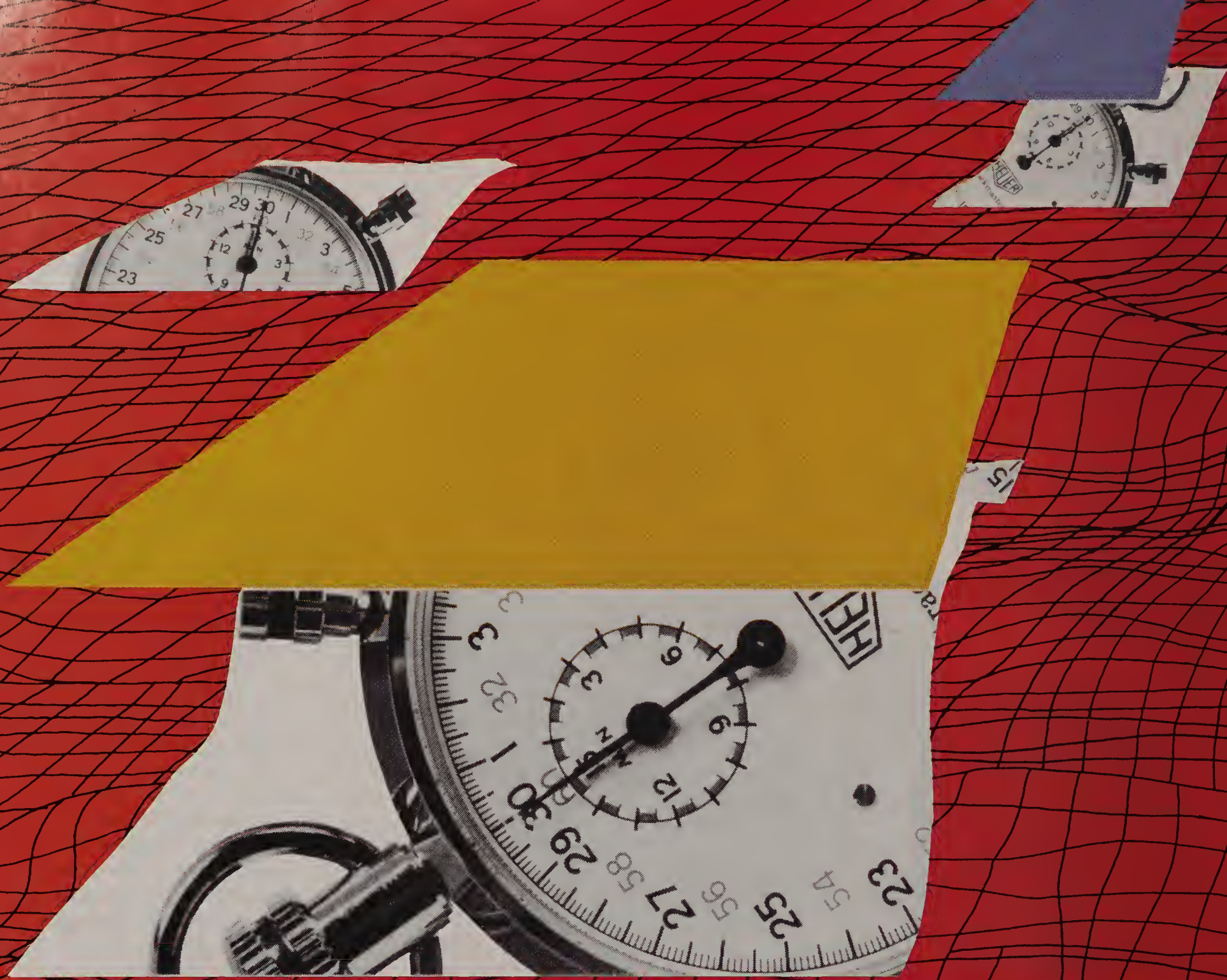
Taken together, all the benefits of subscribing to an information service may justify the costs of a subscription and connect time. But most businesses and individuals do not need instant access to the whole gamut of on-line offerings, from teleshopping and airline schedules to stock market quotes and general news. The information demands of businesses and individuals are highly specific, vary with time, and can often be met more cost-effectively through alternative—and less expensive—sources, such as the public library. There will be no mass market for general information services until the cost of the services approaches the average cost of subscribing to a magazine or a newsletter.

The information services' scattershot approach negates a major advantage of microcomputer technology: the ability to narrowcast information. Although specialized services such as Newsnet and Dow Jones News/Retrieval cost more than general-information services, they are the best buys for businesses that need timely information.

No Standards and Too Much Mail

Without hardware and software standards in telecommunications, network designers are caught in a bind. Because the existing base of users includes a variety of terminals and personal computers, the search for the least common denominator (and the least cost) prevents each network from taking full advantage of the state of the art. Making telecommunications seem easy and intuitive through the still-evolving Macintosh interface takes a lot of hard work and cold cash—more than the infor-

(continues on page 29)



OMNIS 3, ALWAYS

OMNIS 3 is designed as the one database you will ever need to buy – whether you want a simple file manager or a complete business information system. As your database requirements increase, you can take advantage of OMNIS 3's powerful, mouse-driven programming language to customize applications in record time. *And as no other database, OMNIS 3 will grow with your needs.*

OMNIS 3 COMES IN BOTH SINGLE-USER AND MULTI-USER VERSIONS.

"OMNIS 3 is an ideal means to develop customized applications for Macintosh. It is a powerful development tool that provides multi-user solutions for vertical markets." Guy Kawasaki, Manager, Software Product Management, Apple Computer.

"Multi-user capability; microcoding

AHEAD OF ITS TIME.

with the mouse; automatic syntax; your own pull down menus and on-screen button commands...no wonder we're developing custom software in a fraction of the time it used to take with Assembler, Cobol, and the rest." Dr. Michael Sanders, The Program Workshop, Washington, D.C.

"As a straight database, OMNIS 3 functions faster than anything else around." Dr. Felix Evangilist, The Computer Room, Charlotte.

For the name of your nearest dealer call:

(415) 571-0222

OMNIS 3 ™

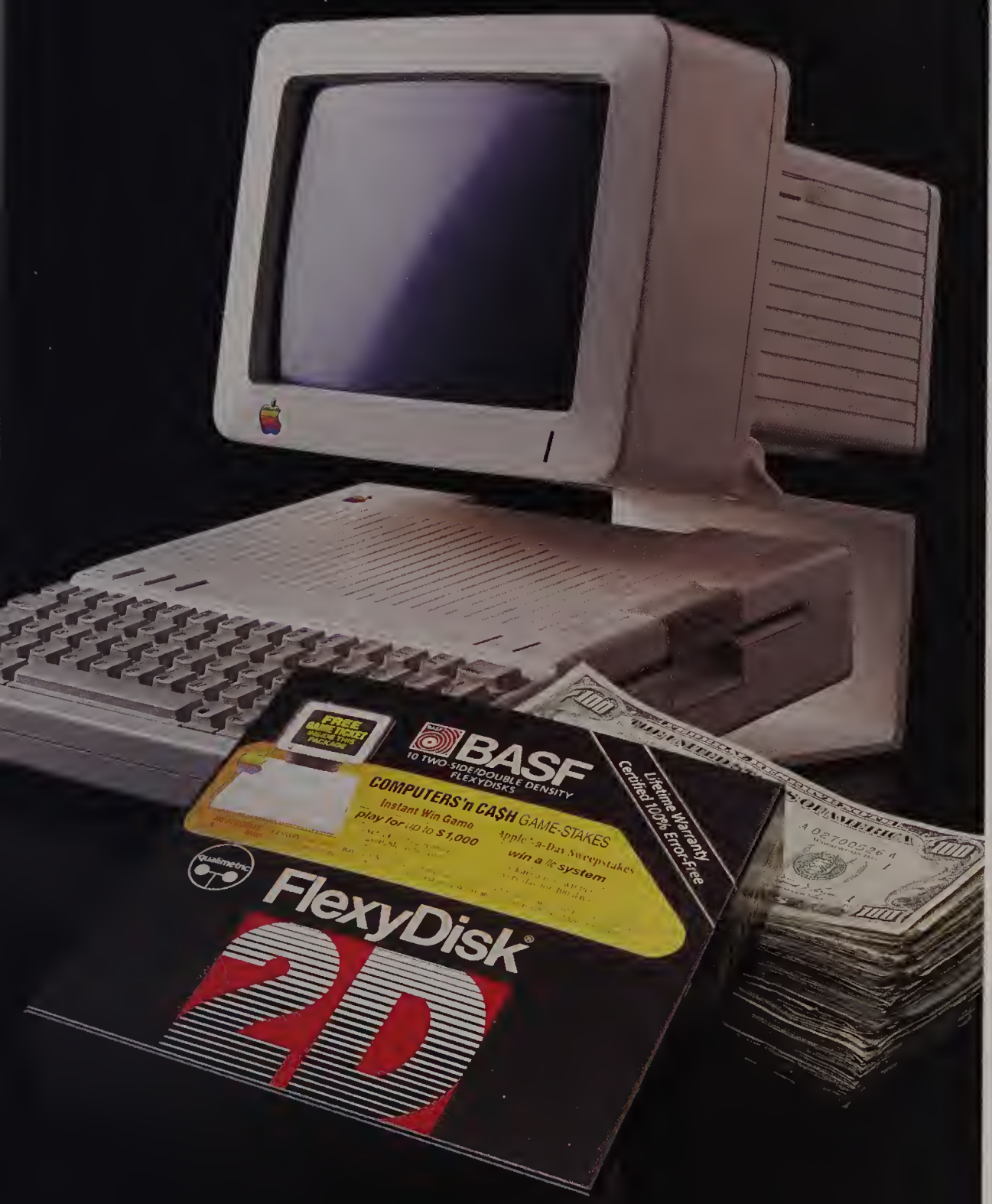
Blyth Software
2655 Campus Drive, Suite 150
San Mateo, CA 94403

Macintosh is a trademark of McIntosh Laboratory, Inc., licensed to Apple Computer, and is used with expressed permission of its owner.

Circle 38 on reader service card

Circle 21 on reader service card

LOOK WHAT'S IN IT FOR YOU!



Now more than ever, there's more for you when you buy BASF Qualimetric™ FlexyDisks.® There's a special two-part game ticket that not only gives you 100 chances to win an Apple® IIc Computer in our Apple-a-Day Sweepstakes, but is also an exciting scratch-off game with 14,110 chances to instantly win cash prizes up to $1,000. What else is in it for you? Only the best...the BASF FlexyDisk, certified 100% error-free and warranted forever. See your BASF dealer today and look for the specially-marked boxes of 5.25″ and 3.5″ BASF FlexyDisks.

Apple and the Apple logo are registered trademarks of Apple Computer, Inc

BASF

(continued from page 25)

mation services can afford. Therefore, before a mass market for on-line information can emerge, telecommunications technology must reach an evolutionary plateau, which probably won't happen until early in the next century.

One of the most oversold capabilities offered by information services is electronic mail, or E-mail. E-mail can't replace all functions of regular mail. Most businesses would not finalize a contract, for example, using E-mail. They would rather depend on hard copy, face-to-face meetings, and overnight delivery services.

In my experience many more people make demands on my time through E-mail than through regular mail if I let them. Junk mail in a post office box is bad enough. Junk messages in an E-mail box are more frustrating because I have to pay for connect time to read sales pitches for information or services I am not interested in and can't afford. Besides, people who intend to communicate with one another electronically must be connected to a network, preferably the same one.

Clearly, to popularize E-mail, network designers must develop a system for validating contracts that is as easy, economical, and secure as mailing a letter.

Even with these caveats, I still recommend getting a modem. The future of telecommunications is wide open. The advent of embedded artificial intelligence features in networks will help filter out junk E-mail. Encryption-decryption systems will provide complete privacy for electronic correspondence. On the other hand, compact disk storage devices will make encyclopedic databases as cheap as paperback books and will further undercut the appeal of information services as they're currently structured. These services, in turn, will respond to the objections stated here and to the twin drives of the marketplace and technology. This response should include a few pleasant surprises for those of us who've been spoiled by the Mac and frustrated by the tangled web the networks weave.

Dean Gengle is the author of The Netweaver's Sourcebook *(Addison-Wesley, 1984) and a telecommunications consultant with the CommuniTree Group in San Francisco.* □

TIME BILLING & MAIL LIST FOR YOUR MAC!

LEGAL BILLING

is a time billing package designed specifically for attorneys.

Legal Billing will track time spent, costs dispersed and credits received. Client statements can be printed in several different formats. A variety of other reports can be printed including time, client and aging reports. This package is powerful enough for larger firms, yet easy enough for smaller firms.

Here is what Legal Billing can do for your professional office:

- Prints your client bills in a variety of formats
- Cuts billing time with fast and easy data entry, using up to 45 modifiable codes
- [illegible] with numerous management reports
- Allows monthly or on demand billings
- Multiple matters per client.
- Prints detailed statements in listed or paragraph format
- Handles up to 27 lawyers or employees
- Full use of the MAC Interface
- It's so easy you can begin using immediately
- Hard disk compatible
- $595.00

Legal Billing, Professional Time Billing and Bulk Mailer are available at your dealer or from Satori Software.

SATORI SOFTWARE

Satori Software
2815 Second Avenue,
Suite 590
Seattle, WA 98121

206/443-0765

Visa
Mastercard
American Express

BULK MAILER

is a powerful program specially designed for managing mail lists large or small. Bulk Mailer does everything you want in a mail list program, including duplication elimination, zip and alpha sorts, 1 to 4 up labels printed, easy-entry defaults, multiple label format, plus much, much more. And this special Macintosh version is incredibly easy to use.

This is the only program to offer all these features:

- Duplication elimination
- Zip or alpha sort
- Car-rt sort or zip + 4
- [illegible]
- [illegible]
- [illegible]
- Mail merge with Microsoft Word
- Envelope printer
- Easy-to-use entry defaults
- Coding and date expiration fields
- Large record capacity (up to 45,000 names)
- Hard disk compatible
- Full use of the MAC Interface
- $125.00

Macintosh is a trademark licensed to [illegible] Computers, Inc.

Word is a trademark of Microsoft Corp[illegible]

NEW! PROFESSIONAL TIME BILLING

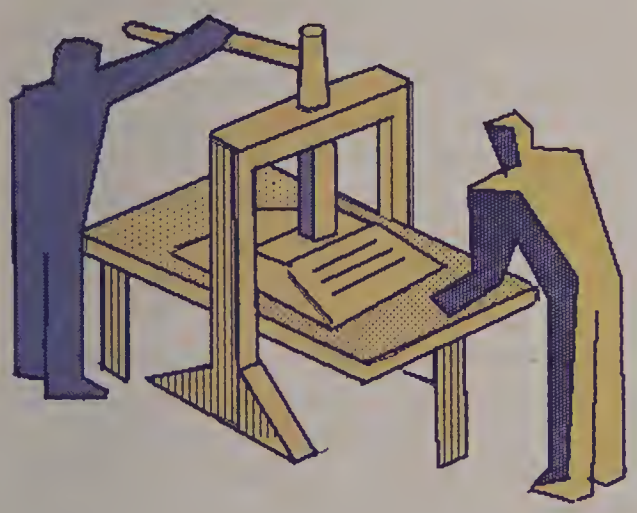
A special package for designers, architects, advertising agencies, consultants or any professional office. Satori's Professional Time Billing will track time & expenses, produce client bills and management reports. $595.00

Steven Levy

Graphic Details: Notes from a Novice Publisher

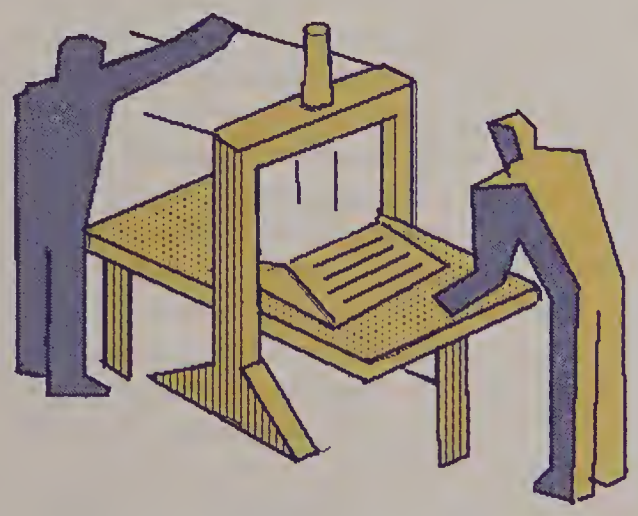
Hard copy about the desktop publishing craze

I once spent a brief internship at a small newspaper in central Pennsylvania. As it happened, that season was a cathartic time in the newspaper's long history: the production process was changing from Linotype to offset printing. This meant that the highly skilled handlers of hot type—those who operated the machines that hammered the lettering into the heated metal and who then, with the lead barely cooled, dealt the type into columns with all the deftness of Vegas blackjack dealers—were rendered obsolete. Since they had been guaranteed job security, their new job was moving around the columns of "camera-ready type"—already-printed text and



headlines—and pasting them on page forms that would be photographed for printing. It was embarrassingly less time-consuming and immeasurably less macho. After all, standing around a layout board is not exactly beer-commercial material. Yet, the men and women swallowed their pride and did it.

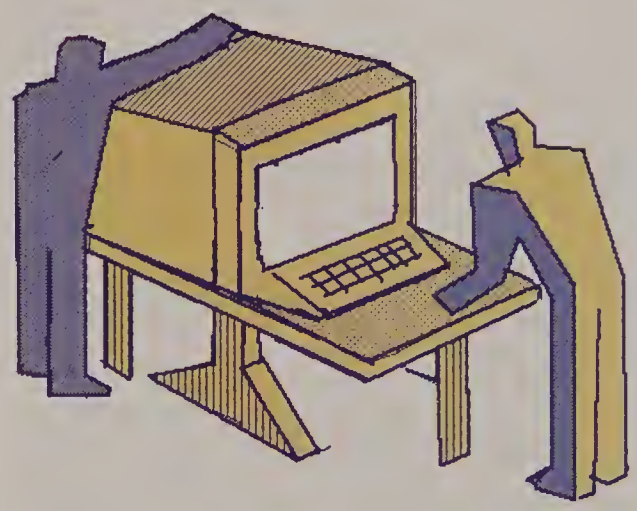
The new process greatly lowered the cost of publishing and made possible a lot of otherwise marginal ventures. If you were to look back and compare what was lost (a culture of Linotype masters whose art form was present in every well-crafted



page of type) to what was gained, you would have to conclude that the change was for the better. Indeed, it is unimaginable to consider any periodical today choosing to use the old style of production, unless it wanted to present itself as a sort of living museum.

Desktop Publishing

As significant as that change was, we are in the opening stages of something even more cataclysmic: the desktop publishing phenomenon. This is a revolution fueled by the convergence of three tools: personal computers, printers that displace typesetters (most notably Apple's LaserWriter), and page-makeup software capable of transforming computer documents into a format that looks, well . . . published. The idea is to eliminate the type shop entirely; one person equipped with less than $10,000 worth of technology can now churn out something that looks typeset.



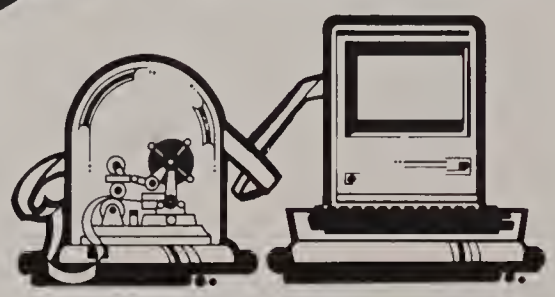
This can result in severe cognitive jolt. For when we view a document that looks "professionally" printed, our assumption is that a certain amount of production time and money went into it. We react to it differently than we do to something created in the familiar, typewriter-style manuscript form. We actually read it differently. In this Stone Age of the desktop publishing phenomenon, these are relatively subtle considerations. But as the trend continues, people will have to consider the consequences of using a technology previously available only to craftspeople.

Some of these considerations became apparent to me only when I attempted my own venture into the world of desktop publishing. As a service to an organization of computer writers I belong to, I volunteered to put together a newsletter. In previous times, standard typewritten output might have sufficed, but a collection of journalists supposedly in touch with the cutting edge of computerdom would look pretty silly with such a low-tech effort. So it was a foregone conclusion that the Computer Press Association newsletter would be not only written but also laid out on a Macintosh, and printed on a LaserWriter.

(continues on page 32)

NOW SHIPPING!

THE INVESTOR



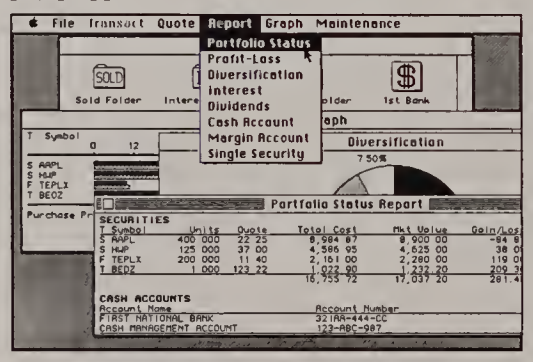
Invest in Your Personal Success

Sophisticated

The Investor is a full-featured portfolio management system created exclusively for the Macintosh. The Investor gives you control over your financial holdings, allowing you to participate in the rousing bull market with confidence.

Versatile

Attain maximum performance with minimum effort. The Investor is easy to use, flexible and fast. A valuable aid for decision-making and tax preparation, it produces over a dozen reports and graphs to record the performance of your portfolios.



Easy To Use

The Investor is the only portfolio management program designed from the ground up for the Macintosh. The program uses icons, windows, dialog boxes and pull-down menus already familiar to you.

See your dealer for a demonstration, or order The Investor directly from us. Our 15-day, money-back guarantee ensures your satisfaction. *VISA and MasterCard welcome.*

THE INVESTOR

$150.00

P3 Programs for Professional People INC.

P3, INC. — (316) 686-2000
949 Parklane Center — Wichita, KS 67218

Circle 492 on reader service card

(continued from page 31)

The Mac, of course, is the machine on which the craze is centered. It is not the only machine that works with the LaserWriter, but it does have the best software for the task.

MacPublishing

The software everyone is talking about is a $495 program called *PageMaker,* but before jumping into that, I thought it would be a good idea to try a more modestly priced package—Boston Software's $99.95 *MacPublisher*. Boston Software's $149.95 *MacPublisher II,* which has several enhancements to the original program, including the ability to open word processing or graphics files directly, a telecommunications facility, and automatic text flow, was not available at the time I created the newsletter. I might also have tried Manhattan Graphics' $125 *ReadySetGo* 2.0, which offers a range of features similar to the other programs.

MacPublisher works by putting a dummy page on the screen. The theory is that you can lay out stories, pictures, and headlines just as if you were pasting up a physical page. It's a logical tack, but in practice it can get somewhat unwieldy. The problem is that every item you lay down on the page has to be in a particular format. You need a separate file for every story, headline, picture, and "continued on page 2." These files add up; I have never messed up my Macintosh desktop quite as thoroughly as I did after an hour of using *MacPublisher*. The manual suggests you reduce clutter by storing the files in folders, but you can't avoid the problem entirely—*MacPublisher* doesn't print unless the files are open. This is like a printing company refusing to accept the finished boards unless the original typed manuscript pages are also provided.

It took me a little time to get used to the way the cursor kept changing from a little arrow to a tiny pair of scissors (which you use to move stories around and cut text to size), and I never did get the hang of using the transparent ruler, which is supposed to size stories and pictures on the page. But eventually I was able to lay out my first page. It took longer than expected, because I frequently had to shut down *MacPublisher* to create a graphic in *MacPaint,* look something up in *MacWrite,* get a file I downloaded from *MacTerminal,* or swipe a piece of clip art from a Simon & Schuster program called *The Mac Art Department.* The notorious Disk Swapper Sore Wrist syndrome began to set in.

My difficulties were more a hardware problem than a flaw in *MacPublisher,* however. Using the software would be much easier with a hard disk for storing the applications and files. In my own case, poor planning aggravated the problem: if I had created everything I wanted to go in the newsletter beforehand and used the Scrapbook, I wouldn't have had to do so much switching. But then, the whole point of desktop publishing is interactivity—the freedom to move things around on the page and, if there's a hole that needs a picture, to instantly whip up something to put in the hole.

That problem aside, *MacPublisher* proved itself capable of doing the job I set out to do and allowed me a good time while doing it. I was creating headlines, moving pictures over from *MacPaint,* and laying out articles—all without my hands getting sticky with rubber cement or hot wax.

PageMaking

Things got even better when I moved to *PageMaker,* the Cadillac of desktop publishing software. The limitations of *MacPublisher* had particularly primed me for the virtues of *PageMaker*. More intuitive commands handle text layout and picture sizing. Unlike *MacPublisher, PageMaker* lets you italicize or boldface words and even write headlines without creating new files. And once you load stories or pictures into the final document, you can get rid of the original files.

It wasn't long before I was drunk with power, switching on three-column formats, selecting documents, and—by a simple mouse click—filling in text neatly down the columns. Then I would move things around, getting the page to my liking, dropping in pictures and resizing them to fit the space. I filled up my eight pages in quick order.

(continues on page 34-35)

(continued from page 32-33)

Coming of Age

Soon I was ready for the acid test: printing the newsletter on the LaserWriter. I do not possess that pricey peripheral, but I live near a fellow named William Bates who not only owns one but has written his own typesetting software, called *JustText.* So I took my disks–just about enough to fill up a box, what with data disks and program disks and startup disks and backup disks and master disks–over to Bates. We fired up the LaserWriter, loaded the software, and told it to print.

Since the LaserWriter doesn't make much noise, it was hard to tell what was happening in there. But in less than a minute, it grudgingly ejected a piece of paper with the first page of the newsletter.

At first, I was bowled over by the quality of what I had done. It looked *real,* especially the headlines, so solid in their Times Roman font, just like the daily newspaper. It was hard to believe that I had single-handedly created that document while sitting at my desk.

I said something to that effect, and Bates looked dubious. "Do you feel that way when you see your *words* in print?" he asked. Well, no . . . but maybe I felt that way the first time I saw my words in print.

I recalled the glow of that moment. The fact that crews of art directors, pasteup people, and printers had worked on my story marked the passage of my work from private habit to public declaration. It had not been an altogether happy event, though. When the initial shock was over, I reread that first story, finally in formidable columns of justified text, arranged in the same way as the words of the writers I had admired for years. For the first time I was able to see where my writing was not quite up to standard. Norman Mailer was safe.

Standing at the LaserWriter, looking at my first foray into the field of design and production, I had similar feelings. A second glance at my newsletter revealed that my graphic skills were woefully inadequate to fully take advantage of what technology had brought within my reach. The newsletter's logo, a combination of text and a graphic, spilled over the middle column almost to the right of the page–I had thought this placement an elegant variation, but it simply looked awkward. Though I had restrained myself in the use of different type fonts, I could see how even the few alternatives in headlines and "continued on page . . . " lines I had tried clashed violently.

The rest of the eight-page newsletter, though impressive in places, was full of similar horrors. There was no consistent scheme for mixing the text with graphics and headlines, no page design to point readers to what I wanted them to read first. These flaws were not so drastic that I was tempted to trash the entire project; the wonders of the software and the laser printer make sure that anyone with a rudimentary sense of layout can create an adequate piece of work. What bothered me was that I, a graphic-design virgin, had suddenly been thrust into competition with renowned graphic designers such as Milton Glaser. I might have had a better chance in a boxing ring with Michael Spinks.

Before depression could set in, Bates began showing me his own desktop publishing software. Unlike the previous two packages, the $195 *JustText* doesn't work with the Imagewriter and doesn't have a preview mode so you can see on screen how things look. We worked on just one page; to get it right, we wound up printing over a dozen tests. But ultimately that page looked more impressive than the output from the other two programs. This was not so much because of the power of *JustText,* but because the page was laid out by Bates, who not only knows the software but knows about professional page layout as well.

And that's the key. I suspect we are going to see a lot more professional-looking documents as desktop publishing technology catches on. The more we see, though, the more we will appreciate documents created with a sensitivity to good art direction, imaginative page layout, and a solid awareness of how to manipulate graphics and text to make an effective presentation.

I can recommend any of the software packages I worked with. But none of them can replace careful craftsmanship. While the tools and techniques of publishing are now within anyone's grasp, the skills still have to be learned. It's as if the cost of airplanes were reduced by several factors of ten: we'd all have Learjets, but we wouldn't automatically know how to fly the contraptions. Most likely, more than a few of us would have some horrid moments circling the airport trying to figure out how to get the thing back on the ground. □

The Macintizer is *better* than a mouse: its stylus gives you precise control for drawing, you can trace original artwork, and it won't clog or skip.

PLUS, the Macintizer plugs directly into the mouse port for 100% compatibility with all your programs—no software modifications required.

Turn your Macintosh into the graphics machine it was meant to be—with the Macintizer.

Contact your dealer or GTCO Corporation for more details.

GTCO Corporation
1055 First Street, Rockville, MD 20850
Phone: (301) 279-9550 Telex: 89-8471

Circle 323 on reader service card

HAVE YOU STRIPPED YET?

It's a question more and more Macintosh owners are asking. And no wonder. What everyone is talking about is Softstrip™. The revolutionary technology that is changing the shape of computer software.

The Cauzin Softstrip System is more than just software or data on paper. Because when you invest in this system, you can do much more with your computer, and for far less than you are probably spending now. You can even create and print out your own data strips.

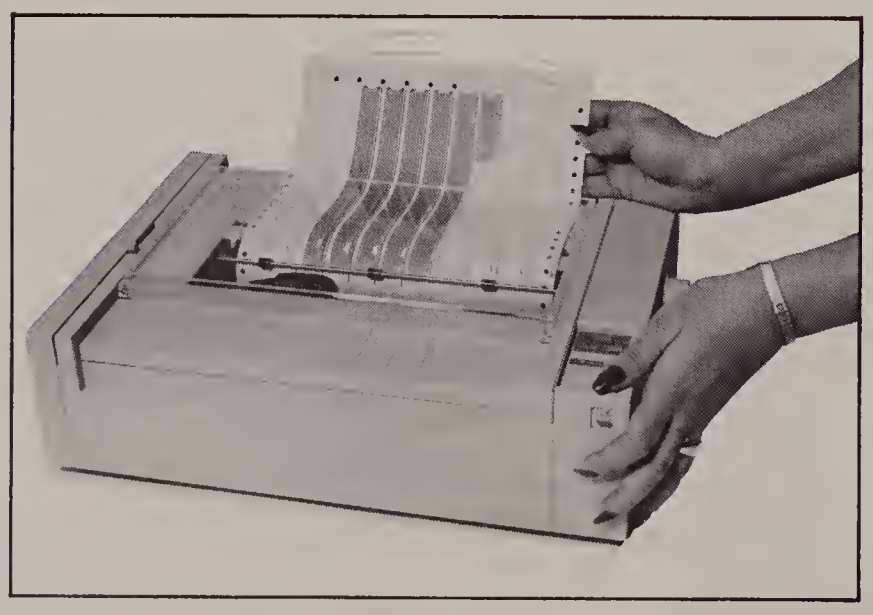
But that's only the beginning of an offer that's going to make you wonder why you haven't stripped yet...

TAKE OUR ADS (SUCH AS THIS ONE)

It's part of our expanding StripWare™ Library containing programs, data, clip art, spreadsheet macros and templates. The Library features a variety of software applications and you'll find new material appearing each month in the leading computer magazines including MAC Apple, MACazine, Mac User, MacWorld, and Nibble Mac.

BUT THERE'S STILL MORE...

When you invest in the Softstrip System, you get the Softstrip reader, a special storage base, and a full one-year replacement warranty. Also included with your purchase is a complete Accessory kit for your Macintosh containing connector cables and communications software to link your computer to the reader.



In addition, you'll find a StripWare Sampler with 23 programs from such popular authors and publishers as Addison-Wesley, Family Computing, Hayden Books, Nibble/MicroSPARC, Osborne/McGraw-Hill, The Waite Group, and John Wiley & Sons.

When you become a Softstrip reader owner, you also get a FREE one year StripWare Club membership with programs mailed to you monthly. You'll even receive a FREE Cauzin Effect Newsletter filled with the latest updates and news about Softstrip developments. And on the pages of such magazines as // Computing and Nibble Mac, you'll find featured programs on strip each issue.

AND IF THAT'S NOT ENOUGH TO START YOU STRIPPING...

You'll find StripWare brand software in authorized Softstrip dealers across the country. Our collection of titles include everything from utilities and entertainment to business programs. There is even a StripWare program that let's your Macintosh talk. All for only $2.98 to $19.98!

StripWare packages offer utilities, games, business programs, templates and much more.

Do you want to create your own data strips? Well, now you can using an Imagewriter dot matrix printer and a special StripWare program called "STRIPPER" that's only $19.95. Just think of the things you could be stripping. Store backup files on paper. Print, copy and mail your own programs to others easily and inexpensively.

The Cauzin Softstrip System is just that, a complete system that opens up a new world of computer programs and data on paper. And it's all yours for only $199.95!

For the Softstrip System Dealer nearest you, (or if there isn't one in your area, to order), call toll free: 1-800-533-7323 (in Connecticut: 203-573-0150)

Softstrip
COMPUTER READABLE PRINT

Cauzin Systems, Inc.
835 South Main St., Waterbury, CT 06706

Apple™ and Macintosh® are registered trademarks of Apple Computer Inc., Apple® is a registered trademark of Apple Records, Inc., Softstrip® and the Softstrip® System Reader are trademarks of Cauzin Systems, Inc., IBM® is a registered trademark of IBM, Inc.

Circle 452 on reader service card

A MACPAINTER'S EYE VIEW

One of the most innovative uses of MacPaint is to present slide shows. Visual representations can be used to market a product, tell an organization's story or even to present an annual report at a convention.

The data strip on the near right contains a graphics utility called **VIEW PAINT** by Steve Dagley and Creative Computer Services. Using the entire screen the program displays just the upper left-hand corner of a MacPaint document. This makes viewing a number of documents a great deal easier.

The program is useful for creating a startup screen or making that important slide show. Store your MacPaint masterpieces on a data disk, and scan your visual library using **VIEW PAINT**.

After you read in the data strip, scan your files and open those MacPaint files you need. Simply Click to view another.

GET CONTROL OF YOUR DISKS

Take a look around the room. Are you slowly being overrun by floppy disks? Maybe you've placed all your valuable disks in a convenient plastic case. What's on the third data disk you come to? Is speedy retrieval of a program for you? Wouldn't it be great to have a librarian to keep track of all the files on your disks?

The three data strips on the far right contain a program called **DISK CAT**, by Craig Vaughan of Software Sorcery Inc. of Virginia, that should help you correct the problem. **DISK CAT** catalogs the contents of your disks. It provides the file name, type, creator, name of the disk it's on, and a "location" field specified by you.

Read in the data strips and RUN the program. It will ask you to enter the location for the batch of disks you want cataloged. Just pop in one disk after another and the contents are cataloged to a library text file with tabs between each field. It's easy for you to transfer the contents to a word processor or filing program for further processing.

These programs appear courtesy of the Boston Computer Society.
MacPaint is a registered trademark of Apple Computer, Inc.

StripWare Library Nos. 204-205

Now, Macintosh Plus Has the Drive to Succeed In Business.

Introducing AST-4000.™ The advanced, hard-disk/tape-backup system for the Apple® Macintosh™ Plus. AST-4000 gives the Macintosh Plus all the sophisticated features required for serious business computing. Together, these two great systems offer powerful, reliable data processing and storage capabilities.

With performance specifications that exceed even the most demanding business computing environments, AST-4000 is fully compatible with the software packages you need most to help run your business.

This high-performance, hard-disk system has the capacity to ably handle the file server needs of AppleTalk® network software like MacServe™and TOPS.™ And provides maximum speed and functionality for your data base software like Omnis 3,™ Double Helix,™ Interlace™ and Business Filevision,™ as well as memory intensive integrated applications like Jazz® and Excel.™

Even with vertical software packages, such as Page Maker™ for desk-top publishing and Dental Mac™ for medical office management, you'll find AST-4000 increases office productivity through enhanced system versatility, storage and data-access speed.

AST-4000 Expands To Meet Your Future Needs. You can order your system with as few as 74 megabytes and, as your requirements grow, add Expansion Units for up to 370 megabytes of total data storage capacity. That adds up to the largest, most versatile hard-disk/tape-backup system available for the Macintosh Plus.

It's fast. AST's advanced Winchester hard-disk is designed for speed and safe, reliable data storage. With a 30-millisecond average-disk-access time your favorite software packages will sizzle with speed. That translates into increased efficiency and higher productivity.

Our 5-megabyte per minute tape data transfer rate also means it's fast and easy to make backup tapes, providing maximum archive security.

A Powerful Business Connection. Thanks to our industry-standard SCSI (Small Computer System Interface) bus architecture design, AST-4000 is fully compatible with the new Apple Macintosh Plus and a variety of readily available peripherals. Additionally, universal compatibility with all leading personal microcomputers is made possible with AST-4000 host adapter kits.

Installation is as simple as unpacking the AST-4000 and plugging it into your Macintosh Plus.

And with our standard utility software, you'll find AST-4000 to be as intuitive and user-friendly as the Macintosh Plus itself.

Hard Driven For Success. AST-4000 is the hard-disk/tape-backup system that can make the Macintosh Plus a successful addition to your business. For a demonstration, visit your local AST/Apple dealer. Or contact AST Research, Inc., 2121 Alton Avenue, Irvine, CA 92714, (714) 476-3866.

AST-4000 Features

- 74-megabyte formatted Winchester hard-disk capacity
- Expandable to 370 megabytes with optional AST-4000 expansion units
- 60-megabyte tape backup
- 30-millisecond average-disk-access time; 5-megabyte/minute tape data transfer rate
- Backup/Restore by volume or file

AST RESEARCH INC.

We Make Apples Grow!

AST-4000 trademark of AST Research, Inc. Apple and AppleTalk registered trademarks of Apple Computer, Inc. Macintosh trademark of McIntosh Laboratory, Inc., licensed to Apple Computer, Inc. and is used with the express permission of its owner. MacServe trademark of Infosphere, Inc. TOPS trademark of Centram Systems West. Omnis 3 trademark of Blythe Software. Double Helix trademark of Odesta Corp. Interlace trademark of Singular Systems. Business Filevision trademark of Telos Software Products. Jazz registered trademark of Lotus Developement Corp. Excel trademark of Microsoft, Inc. Page Maker trademark of Aldus Corp. Dental Mac trademark of Health Care Communications.

Circle 501 on reader service card

Letters

Macworld readers write of upgrades, color, the competition, and more

Loyal to a Fault

Apple has done it again. The new Macintosh Plus is surely an improvement over the existing hardware.

While I applaud Apple for making sure that an upgrade path is available to the owners of existing Macintoshes, I rebel at the price. Let's take a look at the economics of upgrading a Macintosh.

The announced prices of the upgrades are $299 for an 800K drive and new ROM, $599 for a new motherboard with 1 megabyte of RAM and a SCSI interface, and $129 for a new keyboard, bringing the total upgrade price to $1027.

Assuming you paid $2500 for your 512K Mac (as I did), upgrading to the Mac Plus will bring your total expenses to $3527. A new Mac Plus costs only $2599.

Apple has seen fit to reward early loyalty by charging $928 to remain at the current Mac standard. I would feel much more loyal to Apple if they offered upgrades at their cost. The uproar over the old 128K to 512K upgrade had no effect.

Richard Scotty
Spokane, Washington

On the Other Hand

As an early (April 1984) Mac owner, I've never really understood why so many Mac owners are upset that the price has dropped. These decreases were predictable; computers were–and are–constantly improving and lowering in price. So are VCRs and audio compact disc players. I bought my Mac when I did because even at the inflated price, it was a good value for the money. Sure, I would not have minded saving a grand, but my productivity increased dramatically. The Mac paid for itself in less than a year.

Shel Horowitz
Northampton, Massachusetts

A Learning Experience

Last year my wife and I decided to investigate the purchase of a computer for the small businesses we run from our home. In addition, we felt the exposure of our two children, 9 and 11, to the uses of a computer would be beneficial. We purchased an Apple Macintosh last month and find a considerable amount of excellent business software but, alas, very little educational software. We are now wondering if we made a very expensive mistake. We find it difficult to believe that a company that produces a computer with so many positive points can overlook the educational software market. Ask yourself how many parents would spend the extra money for a better computer in the hope that their children will benefit. The market is there; why isn't someone cashing in on it?

Frank D. Mathon
Taylorville, Illinois

Radio Radio Radio

Recently I filed a petition with the Federal Communications Commission requesting that it create a new radio communication service to allow computers to exchange data in a local area network without cables or telephone connections. Before making a decision, the FCC waits to hear from the public. People who have something to say about my Proposal for the Creation of the Public Digital Radio Service can write directly to the FCC, Washington, DC 20554 (refer to RM-5241). For a copy of the petition, contact the FCC copy center at 202/857-3800 or see the copy on CompuServe ACCESS, file name FCC1.DOC.

Don Stoner
Mercer Island, Washington

User Nonchalance

Most reviews of Macintosh software include some wording like "makes full use of the Mac's graphic interface" or "thoroughly conforms to the Mac's user interface" or "extensive use of pull-down menu titles, dialog boxes, and so on . . . in typical Mac fashion." Initially there is nothing earth-shattering about these statements; anyone familiar with the Mac's operating environment would expect to find these points covered in reviews of Mac software. The profound significance begins to come out when the author expounds on these basic statements further into the review, stating, for example, "Anyone with some experience on the Mac already knows how to use 90 percent of this program; we never had to refer to the manual."

We all take this concept for granted. The statement "it moves forward when put into drive and stops when you apply the brakes" would not get much attention in an

(continues on page 45)

Hot Problem

File Edit Select Format Options Calculate

R1C1

Projected Costs

	1	2	3	4	5
1		Quarter 1	Quarter 2	Quarter 3	Quarter 4
2	Costs				
3	Raw Materials	**********	**********	$12,000.00	$13,000.00
4	Manufacturing	$5,500.00	$5,600.00	$5,700.00	$5,700.00
5	Labor	**********	**********	$18,400.00	$19,000.00
6	Shipping	$2,000.00	$2,000.00	$2,600.00	$2,600.00

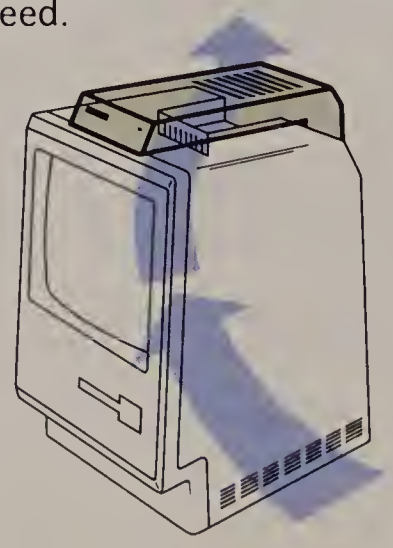
Introducing System Saver® Mac.

Ever put your hand on top of your Macintosh™ after it's been running a while? Pretty hot, isn't it? And that's a problem.

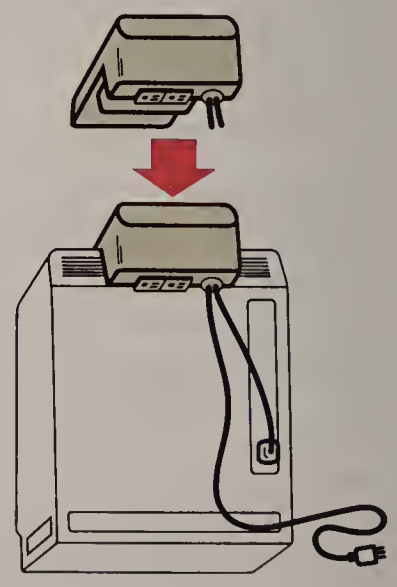
High temperature conditions can affect your computer's circuitry. Even shorten its lifespan. That's why we developed the System Saver Mac.

System Saver Mac keeps your Macintosh cool.

The System Saver Mac's quiet fan draws a breath of fresh air in through the ventilation slots on the bottom left and right sides of the Mac, across the circuit board, over the power supply (the primary source of heat), and out the top ventilation slot (the one hidden under your Mac's handle) at the rate of 17 cubic feet per minute. It leaves your Mac cool, calm and running at top speed.



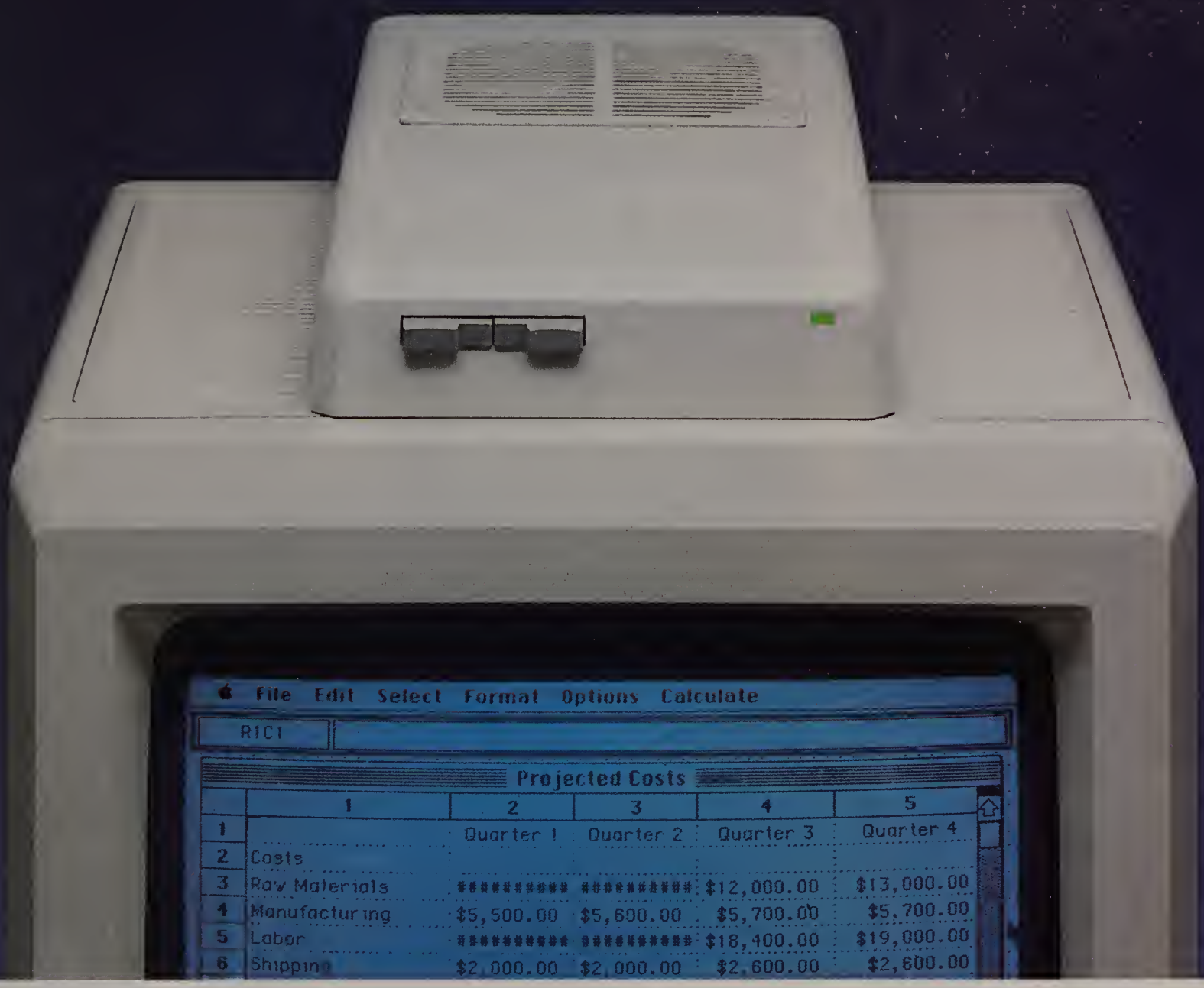
System Saver Mac stops the scramble for power.



No more reaching around to the back of your Macintosh to turn it on. No more fumbling for spare outlets. System Saver Mac organizes all your power needs. It provides outlets for two peripherals (like your printer and modem), while replacing the Mac's power cord.

Cool Solution

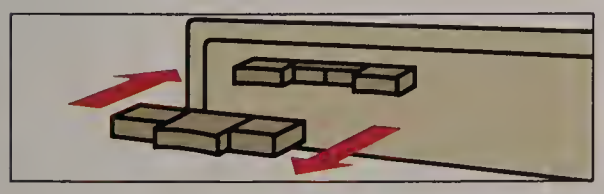
Available June 1st



© 1986 Kensington Microware Ltd.

System Saver Mac has a great switch play.

System Saver Mac comes equipped with two switches—important for those of you who want to power one of your peripherals separately. For example, if you use a Hard Disk 20, you have to power up your hard disk first, before you turn on your computer. Just use one of the System Saver Mac's switches to control your hard disk and the other for the rest of your system.

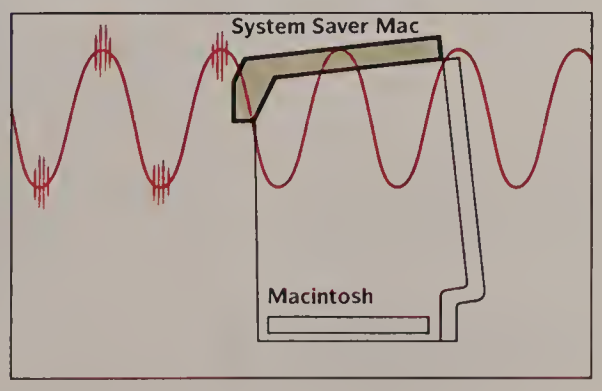


Of course, we realize that many of you would prefer the convenience of a single switch to control your entire system. That's why every System Saver Mac also comes with a special single switch cap. Just pop off the two separate switches and pop on the single one provided.

System Saver Mac provides pure power.

70-90% of all microcomputer malfunctions can be traced to impurities in the electrical current. Line noise can be interpreted as data, confusing your Macintosh and causing annoying system errors. Power surges and spikes can do costly damage to its delicate circuitry.

System Saver Mac clips surges and spikes at a safe level and filters out line noise. It provides pure power to make your Macintosh more accurate, efficient and reliable.



System Saver Mac is not a completely new idea.

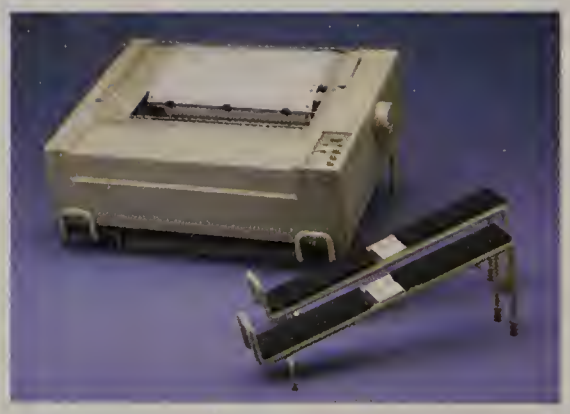
Clever, yes. Versatile, convenient and useful, yes. But not completely new. After all, we've been making the original System Saver for years. It's the best selling accessory ever made for the Apple II—chosen by over 1/4 million Apple II owners. We thought you'd agree—Macintosh owners deserve the best, too.

System Saver Mac, $99.95, is available from Apple dealers everywhere. For the dealer nearest you, or to speak to a Kensington sales representative, call toll-free 800-535-4242. In NY 212-475-5200.

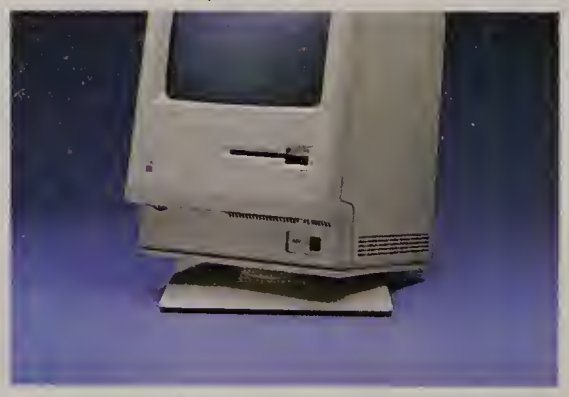
KENSINGTON™

Circle 11 on reader service card

Control Center, $99.95

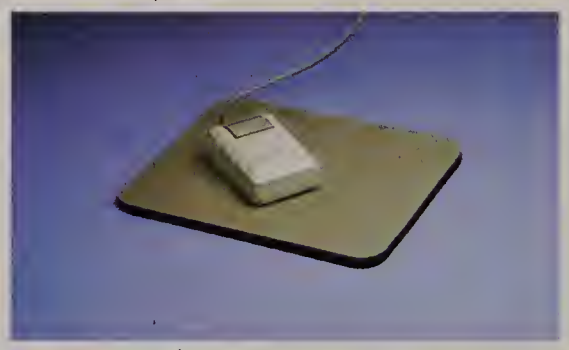

Printer Stand, $29.95

Surge Suppressor, $49.95


Tilt/Swivel, $34.95

Mouse Cleaning Kit with Pocket, $24.95

Mouse Pocket, $9.95


Mouseway, $9.95

A-B Box, $99.95

Disk Case with Disk Pocket, $29.95

Circular Polarizing Filter, $49.95

Disk Drive Cleaning Kit, $29.95

Dust Covers, $9.95 to $13.75

Kensington has a solution for every Macintosh™ problem. Maccessories.®

A whole family of enhancement products for the Macintosh.™

You'll find the perfect solution for every problem. From the complete power organization of a Control Center to the simple, portable protection of a Surge Suppressor. From the convenience of an A-B Box or Printer Stand to the comfortable relief of a Tilt/Swivel or Polarizing Filter.

Of course, the best way to solve problems is to prevent them. That's why we make a complete line of Cleaning Kits and Dust Covers for your Mac.

That's also why we've just introduced the System Saver® Mac! Turn back a page to see this important new peripheral.

For a Maccessories dealer near you, for a free 12 page brochure, or to speak to a Kensington sales representative, call toll-free (800) 535-4242. In New York (212) 475-5200.

© 1986 Kensington Microware Ltd

KENSINGTON™

Circle 11 on reader service card

Win a free LaserWriter™ from Kensington!

That's right—the most powerful peripheral ever made for the Macintosh™ can be yours—FREE! And all you have to do to enter the drawing is something you'd probably do anyway...

Buy a Kensington System Saver® Mac—the most important peripheral ever made for your Macintosh.™ (If you don't know about System Saver Mac yet, just turn back one page to our ad.)

When you buy your System Saver Mac, you'll also get a LaserWriter sweepstakes entry blank. Send that to us, along with the proof of purchase seal from the box and a copy of your sales receipt. And before long, you could be the proud owner of a LaserWriter!

Entries must be received by September 1, 1986—so act now! The winner will be chosen September 30, 1986 and notified by October 15, 1986.

Complete sweepstakes rules on reverse.

KENSINGTON™

Win a free LaserWriter™ from Kensington!

Sweepstakes Rules

1. This Sweepstakes is open to residents of the U.S., its possessions, and Canada. All federal, state and local laws apply. Void where prohibited.
2. Employees of Kensington Microware Ltd. and their immediate families are not eligible.
3. Taxes are the winner's responsibility.
4. No purchase necessary to win. To enter, send a 3" x 5" card with your name, address, daytime telephone number, and the words "Kensington. Complete outfitters to the PC workstation." to: Win a Free LaserWriter Sweepstakes, Kensington Microware Ltd., 251 Park Avenue South, New York, NY 10010. Only one entry per envelope.
5. Entries must be received by September 1, 1986. Any entries received after that date are invalid. The winner will be chosen September 30, 1986 and notified by October 15, 1986.

If you'd like the name of the winner, send a stamped, self-addressed envelope to "LaserWriter Winner,"Kensington Microware Ltd., 251 Park Avenue South, New York, NY 10010.

Macintosh and LaserWriter are trademarks of Apple Computer, Inc.
System Saver is a trademark of Kensington Microware Ltd.
©1986 Kensington Microware Ltd.

KENSINGTON™

(continued from page 41)

automobile review. But, if by adhering to strict rules of form and function, we wind up with software that all works in the same manner—now we have something to shout about.

Can non-Mac users grasp the incredible significance of this concept, or do they, too, skip right over it because they can't imagine the real meaning behind a principle so foreign to them?

Henry Sitzman
Plantation, Florida

In Hard Disk Heaven

A committed MacFanatic for nearly two years now, I am also the proud owner of a new Apple Hard Disk 20. Forget that the HyperDrive is a little faster for the present; speed isn't everything. From anywhere in the HD 20's entire 20 megabytes you can open any document or application. I don't think you can do this with the HyperDrive without opening a particular volume. No volumes here, just straight storage. The new Hierarchical File System performs very well, allowing users to "nest" documents and applications in folders any way that suits their work habits.

Also, forget for the moment that Apple doesn't bundle a backup utility with the HD 20. It will. And if Apple doesn't, rest assured that a slew of third-party developers are laboring over such programs at this moment. Conversely, I suspect that no one but the HyperDrive manufacturer continues to improve its utilities. Nothing against General Computer Company here, or any other hardware supplier. I'm just glad I waited for Apple's unit. History has shown that the industry responds quickly to Apple products. Witness the Macintosh itself.

In short, I am pleased with the Apple unit. It's quiet enough, reliable so far, and very easy to use. And as for having innumerable applications and documents available in seconds? It's a Macintosh user's dream.

Ric Spiegel
Dallas, Texas

A Taxing Error

In "Taking Care of Taxes" in your March 1986 issue, you printed the wrong phone number for our product, *TaxWizard '85/'86.*

Linda Brandt
Santa Monica, California

The correct information is Gamma Productions, Inc., 817 Tenth St. #102, Santa Monica, CA 90403, 213/451-9507.—Ed.

We Stand Corrected

Mr. Bunnell's reverie on his trip to China ("The China Interface," *Macworld,* February 1986) certainly reveals his abilities as a high-tech prognosticator. Indeed, he may soon be writing syndicated columns, à la John C. Dvorak. However, may I suggest that the population of the People's Republic of China may be 4 or 5 times as large as that of the United States, but it is not 15 times as large.

Robert Matutat
San Francisco, California

You are so right. The 1985 edition of the World Book Encyclopedia *lists the estimated population of the United States at 238,420,000 and China at 1,047,800,000.—Ed.*

Regaled by the Tales

I just received my February issue of *Macworld* and completed reading Jeffrey S. Young's article, "Tales of the Macintosh." I was warmed by the story of Steve Jobs and his dream. I have read so many articles that discount and cheapen Apple's Macintosh story that it was refreshing to read this version that shows a bit of the bad but mostly the good of a truly wonderful entrepreneurial event. Steve Jobs and his group may have been young, idealistic, and inexperienced, but their intelligence, personal fortitude, and most importantly their imagination and enthusiasm truly set them apart.

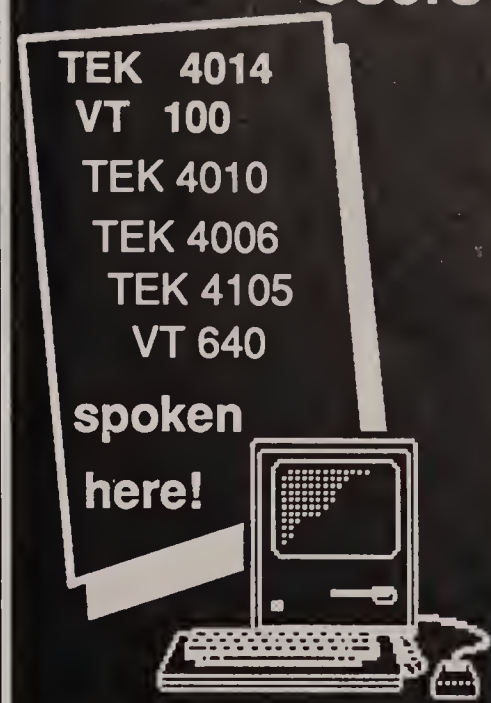
Stacie Lyn Groff
Bellevue, Washington

Déjà Vu

As I read David Bunnell's editorial (January 1986) that maintained the Macintosh doesn't need color and won't until color on a computer screen becomes acceptable and can easily be displayed on a printer, I was saying amen and hallelujah because that's pretty much my opinion (I like the Mac's crisp black-and-white display) until I came upon this sentence about Commodore's Amiga: "Why buy a machine with an entirely new operating system and no software base?"

(continues on page 48)

IBM, VAX... Users!



Tekalike lets you use your Macintosh as a graphic terminal with mainframe applications from Issco Graphics, Molecular Design, Chemical Abstracts Service, Precision Visuals, SAS Institute... and take the IBM, VAX, etc. mainframe graphic to the Macintosh for editing and page composition.

Save documents for MacDraw, MacPaint and Pagemaker.

High quality output via the LaserWriter, the Imagewriter, or plotters.

Price: $250

Other Mesa Products

Plot-It...plots MacPaint documents on Apple, Hewlett-Packard, and Houston Instruments color plotters

Use your MacPaint pictures to create color transparencies for presentations.

Price: $95

Mesa Graphics
P.O. Box 600
Los Alamos, NM
87544 (USA)
(505) 672-1998
Telex II: 5101003099

Circle 97 on reader service card

NOW YOU
BUSINESS CAN DO MORE

The Helix environment from Odesta Corporation is based on the idea that, above all, systems should be responsive to the needs of the people they serve. That whatever stands between you and the information you need is an obstacle, not a feature. That technology should narrow the gap — enabling you to do what you do best, and to get it done quickly.

Helix is a data-based applications environment, since the core of any business system is most properly a data-based foundation.

Helix has evolved — in response to a year of learning what you have been doing with Helix; from listening to you tell us what you want next; through exploiting opportunities afforded by advanced technology.

Helix is an active, evolving environment. Today, Helix addresses the full range of business needs. Double Helix — development of tailored, secure applications. MultiUser Helix — sharing information in a multiuser network. RunTime Helix — runtime generation for applications publishing. Remote Helix — off-site access to the corporate information base.

ODESTA HELIX

Helix is a complete data-based information management and decision support system. It provides a data-based "pool" into which you can put all kinds of information — text, numbers, pictures or ASCII data-communications.

Helix — the system solution
Once information is entered, it is then just as easy to examine from any angle, and use in any application. From reports, lists, and mail merge letters to analyses and interactive searches. All within Helix.

Programming not required
You don't have to learn a query language, spreadsheet formulae, report formatting or data-base algebra. You don't have to know a programming language or battle with command codes, modes, or imposed structure.

All you need with Helix is the desire to improve your business management and administrative systems.

$395

ODESTA Double HELIX™

Custom menus and more
Now you can develop and then customize even more new, powerful applications. To the Helix environment, Double Helix adds subforms, the fast creation of custom menus, password protection, data validation, extended data import and export capabilities, and optimized performance characteristics. Of course, anything already built with Helix version 2.0 may be automatically updated to Double Helix.

Build it up, lock it down, keep the key
Double Helix lets you design a complete system to run a small business, medium office, or large departmental project. Custom menus then make the whole system easy to use by clearly associating forms with functions. Password protection lets you lock it down to prevent unauthorized changes. Yet, since one of the main features of the Helix environment is its ability to change as conditions change, you or your key users can easily make modifications on an as-needed basis.

$495

A system that you can mix and match, and that expands as your needs grow. For co

AND YOUR
OF WHAT YOU DO BEST

MultiUser HELIX

The promise of a network
The idea of running a business using shared information in a direct and affordable way has been one of the premises and promises of the "computer revolution" since it began. In a number of important respects, MultiUser Helix is the first fulfillment of that promise.

Just plug it in
You don't have to worry about a "file server" or other special hardware or software. MultiUser Helix turns any hard disk into the host for a whole network. Just by using the "visit" command, you can be working within a dynamically interactive network, in which all windows are updated automatically.

The benefits of a breakthrough
With MultiUser Helix, everyone within a company or department can work from common project, inventory, customer, ordering or financial information. The direct benefits from both an operational and management perspective are dramatic.

$695-$2500

RunTime HELIX

Now, you can publish your own Helix applications with RunTime Helix. Any application built with Double Helix can be run through the runtime generator, creating a stand-alone program for sale or distribution.

Start a whole new business
If you are an existing VAR, or an up-and-coming entrepreneur, here is the opportunity to leverage the dynamic attraction and functionality of Helix applications into a wide range of new business.

The birth of applications publishing
Or you can easily provide a variety of applications to others within your organization — from expense reports to sales tracking; from departmental phone lists to project coordination.

By offering an organizational site licensing program for RunTime Helix, Odesta helps you bring a new dimension to the concept of "desktop publishing" — the in-house publishing of specialized applications.

$500/10 applications
(site license available)

REMOTE HELIX

Close the circle with Remote Helix — the way to communicate with your central Helix information base from the field, home, or satellite office — anytime.

A modem, and then magic
You can modem straight into your "central" Helix, and be immediately on-line...as if you were working directly in your main office. And, if you are running a MultiUser Helix environment, Remote Helix will log you on as a live member of the network.

System access from anywhere
Receive orders from, or transmit information to, your sales force in the field; tie sites together for communication and coordination; or have 24-hour access to the heart of your business, no matter where you are. With Remote Helix, global telecommunication becomes an information management tool for you to use, now.

$150

departments, small business/professional services, independent consultants, research establishments...

Circle 13 on reader service card

© 1986 Odesta Corporation Odesta Helix is a registered trademark of Odesta Corporation, 4084 Commercial Avenue, Northbrook, IL 60062 U.S.A. 800-323-5423 (IL: 312-498-5615)

FASTER...MORE POWERFUL...QUIETER

DOUBLE SIDED 800K 3.5" EXTERNAL DRIVE

100% Macintosh™ Compatible

Featuring *More for Less*

AUTO EJECT Not Manual

ONE YEAR WARRANTY

Quality COPAL Drive Mechanism
Reads Double & Single Sided Disks

Complete and Ready to Use

800-325-1895
In Connecticut call 203-488-8993

Circle 470 on reader service card

MICROTECH PERIPHERALS
A division of Microtech International Inc.
29 Business Park Drive/Branford, CT USA 06405

Dealer inquiries call **800-626-4276**

Letters

(continued from page 45)

Mr. Bunnell's memory may be short, but I remember people telling me, "Don't buy a Macintosh. It's got a new operating system that's different from all the other Apple computers, and the only software for it is *MacPaint* and *MacWrite*."

Jennifer Petkus
Colorado Springs, Colorado

Color It Sold

I fully agree with the January 1986 article by Mr. Bunnell on the case against introducing a color version of the Mac too early. However, there is an important consideration that he did not cover: color, like sex, sells. Why else would all the laundry detergents be packaged in the most splendiferous, eye-catching colors possible? Even if it costs an arm and a leg, a high-end color console might just pay for itself by selling the cheaper goods. Sounds a bit mercenary, but it works.

Bob Hall
Seattle, Washington

A Shade of Blue

I was greatly disappointed by David Bunnell's column in the January issue of *Macworld,* especially some statements reminiscent of the things the IBMers said about the Mac when it first came out.

Contrary to what the column said, the color on the Amiga is far and away better than the resolution on the IBM. A demonstration of the *Masterpaint* program clearly shows this.

I could not believe that Mr. Bunnell asked, "Why buy a machine with an entirely new operating system and no software base?" Only a year ago Mr. Bunnell said, "Unfortunately, computer critics tend to predict with blinders on. They can't understand why the Macintosh sells so well, and they continue to moan about the lack of software for the machine" (*Macworld,* December 1984).

I hate to think that the Mac community has become as nearsighted and entrenched as the IBM blue suit crowd that we scoff at. Please promote the Mac based on its merits, not on the alleged faults of other computers.

Dennis Boyd
Monmouth Junction, New Jersey

(continues on page 51)

The C for the Macintosh

"Library handling is very flexible... documentation is excellent... the shell a pleasure to work in... blows away the competition for pure compile speed... an excellent effort."

COMPUTER LANGUAGES, 4/85

Why Professionals Choose Aztec C

Professionals choose Manx Aztec C development systems because they are the most powerful, portable, and professional microcomputer C development systems available. Professionals know that Manx Aztec C offers the features, dependability, and performance required for producing professional results.

Applications implemented with Aztec C development systems range from real time control of robot arms used in manufacturing, to message switching systems, to games, languages, operating systems, and business systems.

Much of the commercial software for the Apple Macintosh including top selling titles from software publishers Broderbund, Hayden Software, and Spinnaker is developed using Manx Azec C.

Value, Performance, and Flexibility

Manx Aztec C68k for the Macintosh is available as a line of three upgradable development systems: Manx Aztec C68k-p, Manx Aztec C68-d, and Manx Aztec C68k-c. Student, noncommercial, and small business discounts are available. Whatever your budget and requirements, there is a Manx Aztec C68k development system that offers you the best value and performance for your investment.

New Macintosh Mouse Interface

The highly acclaimed, powerful, and professional Manx Aztec SHELL development environment now includes a mouse interface. Developers unfamiliar with UNIX or MS-DOS can work entirely with the mouse interface. Those interested in learning the advanced features of the SHELL can do so at their leisure. Developer's familiar with UNIX or MS-DOS can ignore the mouse, if they so choose, and work entirely in a familiar command driven environment.

Aztec C, The Most Portable C.

Manx Aztec C Development Systems are available for the Apple Macintosh, Apple*II*, IBM PC, PC compatibles, CP/M-80 systems, Radio Shack Systems, and the Commodore 64/128. Manx Aztec C is also compatible with UNIX and UNIX ports. Manx currently is developing systems for the Amiga and other microcomputer systems. No other C Development System for the Macintosh comes close to the portability of Manx Aztec C.

Power To Spare

In benchmark after benchmark, Manx Aztec C appears in column after column as the clear winner.

The following sieve benchmark timings are reprinted with permissions of Computer Languages, 131 Townsend Sr., San Francisco, Ca 94107 from a Macintosh review that appeared in the April, 1985 issue:

compiler	compile/link	run	size
Manx Aztec	49	7	13,274
Megamax	114	7	13,816
Softworks	201	9	46,914
consulair	152	10	17,654
Hippo 2	102	13	30,648

The following sieve benchmark timings are reprinted with permission of Macworld, 555 De Harro St., San Francisco, CA 94107, from the May, 1985 issue from "Mac Wins By a Length" in the Open Window column.

Language	Run Time
Aztec C 1.06C	6.55
McFORTH 2.0	20.01
Modula-II	71.60
MBASIC 2.00	1170.00
Pascal	1270.00

Sieve timings for Manx Aztec C68k 1.06g:

with register variables 3.37 secs 5,007 bytes
without register variables 6.02 secs 5,140 bytes

Manx Aztec C68k - Professional Tools

Manx Aztec C68k is bundled with a rich abundance of tools to help produce superior results in reasonable time frames. The following is a list of features and facilities included in Aztec C68k-d, the Developer's System, and Aztec C68k-c, the Commercial system. Items that are marked -c are unique Aztec C68k-c.

Optimized C	Mouse Enhanced SHELL
UNIX-like SHELL	Creates desk Accessories
Macro Assembler	Creates Clickable Applications
Smart Overlay Linker	Phone Support
C-PASCAL Interface	PASCAL-C Interface
Resource Compiler	UNIX Library Functions
Debuggers	Terminal Emulator (Source)
Object Librarian	Easy Access to Mac Toolbox
Mouse Editor	unlimited code size
IEEE floating point	six register variables
Inline assembly	extensive sample programs
600 page manual	hard disk support
no license fees	PASCAL type strings
MacinTalk support	AppleTalk support
code optimizer	symbolic debugger (512k)-c
MacRam Disk-c	UniTools (ul, make grep, diff)-c
Library Source-c	One Year Of Updates-c

Summary

If you plan to program in C on the Macintosh or are currently doing so using a brand x C compiler, there is a Manx Aztec C68k system for you that offers the best value and the greatest degree of portability, power, and professional quality available.

Look around, evaluate, and compare. The more you look, the more you compare, the more you will see that Manx Software Systems has succeeded in its objective to provide you with the best C development system available at the best possible price. Then, give us a call, and join the 25,000 users who already know and enjoy the Manx Aztec C advantage.

Products and Prices

Aztec C68k-c Commercial System	$499
Aztec C68k-d Developer's System	$299
Aztec C68k-p Personal System	$199
C-tree database (with source)	$399
Lisa Kit	$ 99
MS-DOS → Macintosh Cross	$750

Discounts

Discounts are available for professors, students, independent developers, hobbiests, and small businesses.

How To Become an Aztec C User

To become an Aztec C user call 1-800-221-0440 or call 1-800-832-9273 (800-TEC WARE). In NJ or outside the USA call 201-530-7997. Orders can be telexed to 4995812.

Payment can be by check, COD, American Express, VISA, Master Card, or Net 30 to qualified customers.

Orders can also be mailed to Manx Software Systems, Box 55, Shrewsbury NJ, 07701.

How To Get More Information

To get more information on Manx Aztec C and related products, call 1-800-221-0440 or 201-530-7997, or write to Manx Software Systems.

30 Day Return Policy

Manx has a 30 day return policy. If you don't like your Manx Aztec C development system, return it within thirty days for a refund. Refunds do not include shipping costs, and might incur a small restocking charge.

Distribution Of Manx Aztec C:

In the USA, Manx Software Systems is the sole and exclusive distributor of Aztec C. Any telephone or mail order sales other than through Manx are unauthorized. Aztec C is available from qualified retail outlets under license to Manx Software Systems.

Circle 112 on reader service card

MANX

To order or for information call:

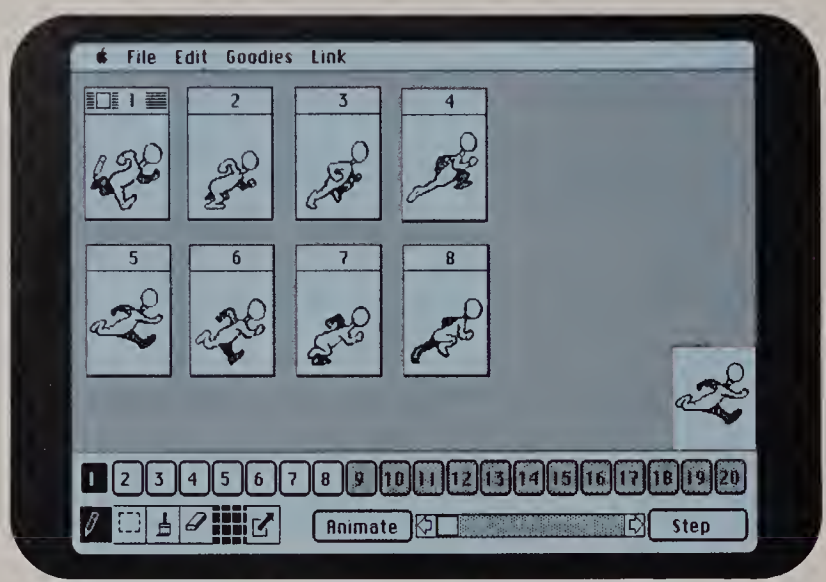
800-221-0440

UNIX is a registered TM of Bell Laboratories, Lattice TM Lattice Inc., C-tree TM Faircom, Inc., PHACT TM PHACT ASSOC. CI Optimizing C86 TM Computer Innovations, Inc., MACINTOSH, APPLE TM APPLE, INC. Pro-C, PUNK 88, TM PHOENIX, HALO TM Media Cybernetics, Inc., Cyber, PC-Kit TM GIMPLE Software, Windowman, SunScreen TM Surftec, PANEL TM Roundhill Computer Systems Ltd., WINDOWS FOR C TM Creative Solutions, XENIX MS TM MICROSOFT INC., CP/M TM DRI, AMIGA, C64, C128 TM COMMODORE Int.

The Graphics Magician®

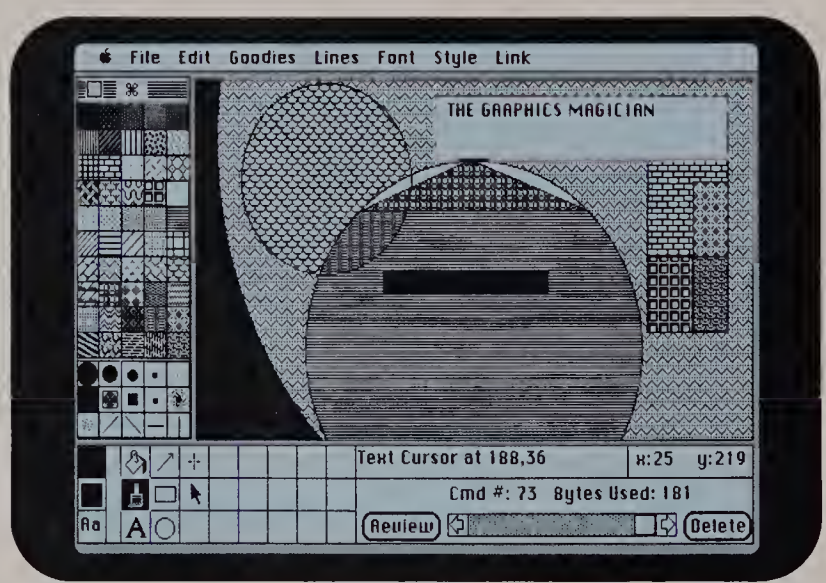
PAINTER AND ANIMATOR

for the Macintosh by Eagle Berns and Roger Lawrence



ANIMATION

Create and choreograph animated shapes as small as a few pixels or as large as the entire screen. Clip shapes out of MacPaint images, or draw them yourself . . .



COMPACT PICTURES

Draw pictures that require only a fraction of the space normally taken (instead of saving images, The Graphics Magician saves the artist's moves) so hundreds of pictures fit on a single disk!

USE IT IN DEMOS, PRESENTATIONS, OR YOUR OWN PROGRAMS!

Like most other "animation" software, you can create demos and presentations. But with The Graphics Magician, you can also access and control everything from your own programs! Calling and controlling the animation and graphics routines from BASIC, Pascal, or machine-language is simple!

Furthermore, The Graphics Magician is not copy-protected, and we do not charge a licensing fee for use in your own software (we do require an acknowledgement). Discover why The Graphics Magician for the Apple II is the end-users' favorite graphics software (Softalk Readers Poll 1983, 1984, A+ Readers Poll 1985). And how it's so much better on the MAC!

See it at your favorite store or phone (800) 323-0884.

POLARWARE™

from Polarware/Penguin Software, Inc.

Apple is a trademark of Apple Computer, Inc. and Macintosh is a trademark licensed to Apple Computer, Inc.; The Graphics Magician is a registered trademark and Polarware is a trademark of Polarware/Penguin Software, Inc.; Penguins have a super-bowl on Tuesday night.

Circle 480 on reader service card

(continued from page 48)

Beware the Red Herring
I use a Mac at work, but I recently decided to buy an Atari 520 ST after considering both the Mac and the Amiga. In all my encounters with the Amiga, I've never seen a black-and-white monitor made specifically for it; David Bunnell must have been thinking of the Atari ST when he referred to the monochrome monitor in his January column.

The way Mr. Bunnell dwelt on the Amiga, I got the impression that he considers it the major competitor to the Mac. With the Atari 520 ST's $795 price tag, the power that it represents, and the head start it has on software, it will prove to be a greater threat, I think.

Larry Kelly
Pasadena, Texas

Don't Judge This Book by Its Color
I agree with much of what David Bunnell said in his January column concerning the present state of color graphics on personal computers. Color is not the only difference between the Mac and the Amiga, however, and I think you are underestimating the Amiga.

The Amiga has three custom chips that take much of the processing load for sound, graphics, and disk I/O off the 68000. The result is that the 68000 in the Amiga can be dedicated almost exclusively to the execution of programs, instead of the housekeeping tasks that the 68000 in the Mac spends almost half its time handling. Also, the fact that Apple put a disk controller chip on the recent Mac upgrade shows that Apple is realizing the value of unfettering the 68000. The Amiga operating system is truly multitasking; even the Mac with the *Switcher* cannot claim that. The Amiga has the potential to do everything that the Mac does, and probably faster.

Stephen G. Heyl
Washington, D.C.

Competition Is the Mother of...
I believe we need the Amigas and the Ataris to spur on Apple to create a system that is an example of what Apple can really do.

Charles Pritt
Irving, Texas

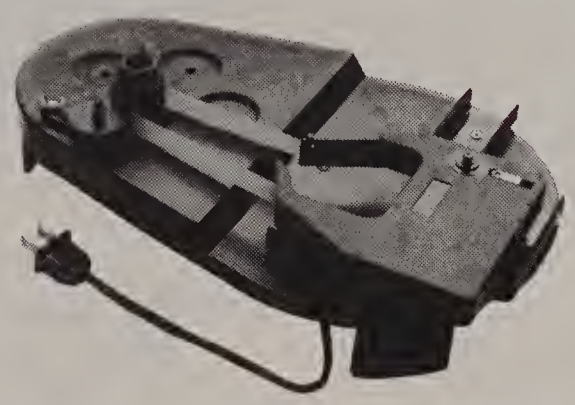
(continues on page 56)

MacInker™

Re-Ink Any Fabric Ribbon Automatically for Less Than 5¢

Imagewriter 1 & 2 MAC INKER
now $42.00 (shipping $3.00)

Extremely simple operation. We support the Imagewriter(*) and over 1500 other brands of printers (cartridges/spools/other type). The new Imagewriter MAC INKER (model 234IM) is $42.00. The **Universal Cartridge MAC INKER** is $68.50 (supports over 100 types of cartridges). Our lubricated dot matrix ink ($3.00/bottle) yields a darker print than most new ribbons. Estimated number of re-inkings per cartridge: 60-100. Cost/re-inking approx. 4 cents. MAC INKER has been reviewed, approved and flattered in most magazines, even in the *New York Times* and the *Chicago Sun Times*.



(Universal w/Imagewriter Cartridge)
Over 50,000 MAC INKERS in the field (Jan. 15, 1986).

RE-INK IN COLOR TOO.
Good quality, guaranteed Imagewriter Cartridges.
Our **Rainbow Pack** (6 cartridges Brown, Blue, Red, Green, Yellow, Purple) is $32.00.

HEAT TRANSFER CARTRIDGES
(add some graphics to your clothing)
BLACK/RED/GREEN/
BLUE $7.50 ea.

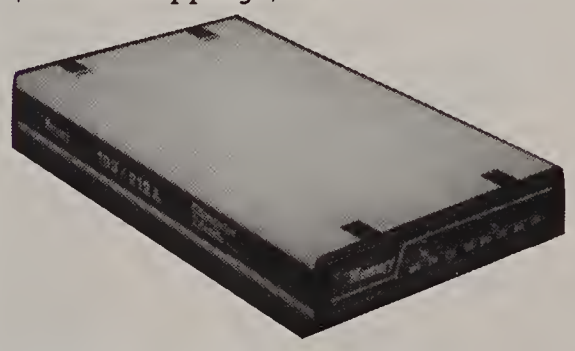
(*Imagewriter is a trademark of Apple. Mac Inker is a trademark of ComputerFriends. We were "Mac" well before anybody else.

Mercury™ Modem

- 100% Hayes* Smartmodem Compatible.
- 300/1200 Baud Speed
- Audio Monitor w/Volume Control
- Front Panel Lights
- Easy-to-Read Manual
- 18-Month Warranty.

$205.00

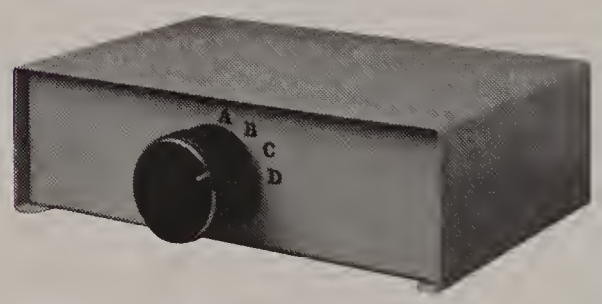
Includes power supply & telephone cable. Macintosh to modem cable $12.00. Shipping $4.00.



Hayes is a trademark of Hayes Microproducts

Macintosh Multiport Switch

Connect up to 4 peripherals to your printer or modem port. 9 pin connectors mounted on real panel (same as in your MACINTOSH). All-metal case.



$50.00

Connecting cable MAC-to-SWITCH $10.00. Shipping $3.00.
Call us for any type of data switch.

Order Toll Free 1-800-547-3303
or ask for free brochure.
In Oregon and for 24-hour service
(503) 297-2321
Telex 4949559 CF

Computer Friends
6415 SW Canyon Ct., #10
Portland, OR 97221

Dealer Inquiries Welcome

Circle 271 on reader service card

All of us at Icon Review are active Mac users. We have hands-on experience with what works and what doesn't. Our highly qualified network of Mac experts help us evaluate specialized products. We believe in the quality and value of these products. We won't sell anything we wouldn't use ourselves!

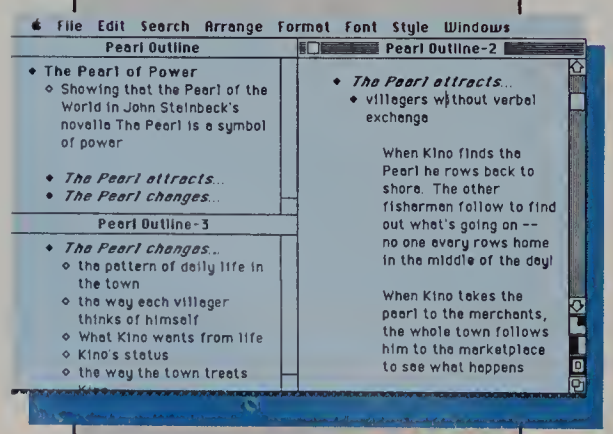
Choose from our Collection of Select Macintosh Products All at Fantastic Savings!

The Icon Review Showcase

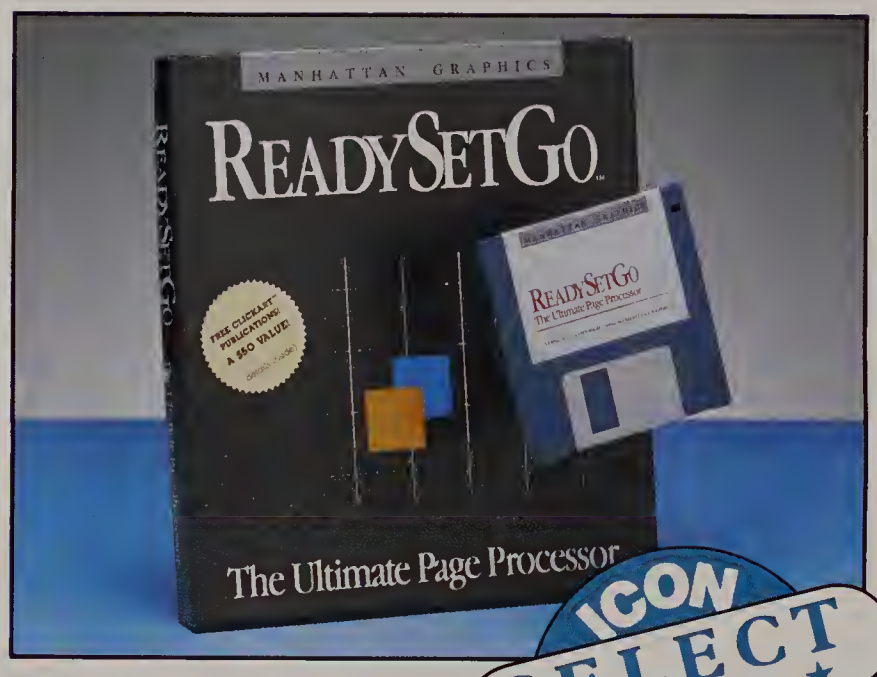
SPECIAL

MultiWrite **$79**
From MindWork Software

MultiWrite sets a new standard for Mac writing tools with a word processor and an outlining program built into one smooth package. MultiWrite is MacWrite compatible, including the same fonts and typestyles, and adds the ability to create outlines. Unlike other outliners, MultiWrite makes it easy to switch headers for text and viceversa. Instead of waiting to cut and paste, you move paragraphs



around the screen quickly by dragging them with the mouse. You can open up to twelve windows with views on the same or different documents. If you do any writing with the Macintosh you should be working with MultiWrite.



ReadySetGo **$125**
From Manhattan Graphics

ReadySetGo's latest version is a sleek addition to the field of desktop, or personal, publishing. If you've ever wanted to create your own newsletter and reports, ReadySetGo will make it easy to get off the starting block. It's easy to create text in ReadySetGo's internal word processor. Documents can be easily linked together and text and graphics can be easily added up to the last minute. ReadySetGo offers incredible speed due to RAM-resident operation, and offers a capacity of 40 pages. It supports nearly any printer you can think of, including the Allied Linotron typesetter. Get ReadySetGo and your documents will look as good as you've ever imagined!

CALL **TOLL FREE** & GIVE US A CHANCE TO MATCH ANY ADVERTISED PRICE

MONDAY THRU SATURDAY 8 A.M. to 6 P.M. (Pacific Time)

ORDERS **800/228-8910**

IN CALIFORNIA **800/824-8175**

Top Mail **$250**
From Top Express

Here at Icon Review electronic mail is vital and in our book Top Mail is, well, tops. It's the only E-mail program that installs directly into the Mac as a desk accessory, and doesn't require a hard disk. It's instantly available for

transfer of any Mac file including text, pictures, spreadsheets, and even whole applications. Unlike other electronic mail programs, you don't have to worry about setting up both ends of a communication. Even if the receiving computer is turned off it can handle your message. Other conveniences include no limit to the number of users and no copy protection scheme on the disk. At last you can get the convenience and ease of E-mail on your Mac network!

Icon Review

Rags to Riches
From Chang Labs

Rags to Riches brings Macintosh style to the accounting process. MACazine voted it the Best Accounting Package of 1985! Rags to Riches makes accounting procedures easier by adhering to the standard Macintosh user interface, and speeds operations by keeping them in RAM. Rags to Riches modules work smoothly together, and their innovative use of windows establishes an easy-to-understand hierarchy of information. Each module supports up to 5,000 accounts/10,000 transactions. And now a new Inventory module is available! Chang Labs provides excellent documentation and support for this time-proven, best-selling product. Automate your books with style and confidence with Rags to Riches!

Gen Ledger	$105
Acct's Pay	$105
Acct's Rec	$105
3 Pack (All the above)	$279

disk•book
From MicroStore

Disk•book is the ideal product to carry your valuable Mac software from place to place. Proudly crafted in the U.S.A. of the finest materials including anti-static nylon, it stores disks as securely as a case and displays them like an open book. Disk•book is light weight and fits easily in a briefcase. Open disk•book and all disk labels are visible; when you close it you can be sure that its unique top seal will remain closed so your disks won't fall out. Available in four colors and in two sizes for either 10 or 32 disks. Get a disk•book now and stop worrying about how to transport your software!

Large disk•book	$22
Small disk•book	$14

Think Technologies
In-Box *NEW* $199
Send electronic mail over AppleTalk

Top Express
Top Mail $250
Unlimited Electronic Mail and file transfer over AppleTalk! No hard disk required.

HARDWARE

Assimilation
Mac Turbo Touch $95
Replace your mouse with this trackball
Numeric Turbo $129
Trackball with numeric keypad

Canon
PC20 Personal Copier $CALL
PC25 Personal Copier $CALL
Canon copier accessories $CALL

Cuesta
90 Watt Datasaver $299
200 Watt Datasaver $399
Protection from power blackouts

Ergotron
MacBuffer 256K *NEW* $119
MacBuffer 512K *NEW* $299
MacBuffer 1024K *NEW* $459
Hot new print buffer

GTCO Corporation
MacIntizer $479

Icon Review
Memory Upgrade
128K to 512K *SPECIAL* $239
512K to 2 Meg. *SPECIAL* $639
128K to 2 Meg. *SPECIAL* $779

Kensington
Control Center $65
Surge Suppressor $34

Koala Technology
Mac Vision $175
Puts images from your video camera into Mac

Kurta
PenMouse+ $299
Quality digitizing tablet with cordless stylus

Summagraphics
MacTablet $299
Absolute pointing device, great for tracing drawings

Systems Control
Mac Gard $55
Protect your Mac from power surges

Thunderware
Thunderscan $175

Video 7
Mouse Stick $36

DISK DRIVES

AST
AST-4000 $5,900
74 meg Winchester with 60 meg tape backup

IOmega
Bernoulli Box *NEW* $CALL
For Mac Plus—all sizes available

LoDOWN
10 Meg SCSI Disk $695
20 Meg SCSI Disk $895
40 Meg SCSI Disk $1795
80 Meg SCSI Disk $3495
Tape Backup 20 Meg $795
Tape Backup 60 Meg $1595

MacVentures
QuickDrive
500K External RAM Disk $399
2 Meg External RAM Disk $799
Extension Modules $CALL
Battery Backup $119

Mirror Technologies
Magnum Ext. 800K Drive $299
20 Meg SCSI Drive Internal $999
20 Meg SCSI Drive External $999
Mirror 20 Meg Tape Backup $999

Paradise Systems
Mac 10 *SPECIAL* $579
Mac 20 $799

PCPC
Macbottom 20 Megabyte $1149
Most Mac-like personal hard drive

Western Automation Labs
Dasch
500K External RAM Disk $399
1000K External RAM Disk $699
2000K External RAM Disk $799

ACCESSORIES

Assimilation
Mac Daisy Wheel Connection *SPECIAL* $69
Mac Port Adapter *SPECIAL* $59

Beck Tech
Fanny Mac *SPECIAL* $79
Fan fits in Mac's handle
Facts of Mac Posters (2) $17
Mac schematics chart

Blowhard
MacFan *NEW* $89

Caribbean Enterprises
THE Bag *NEW* $129
Quality leather tote bag for Mac

Computer Aid
Macintosh Bag $69

Computer Friends
MacInker *SPECIAL* $55
Save $$ by re-inking ribbons—includes ink!

Eichner
Disk Holder $25
Disk Holder with Lock $33

Ergotron
Mac Tilt $79
Swivel stands for Mac & 2nd drive

Icon Review
Head Cleaner $19
Mac Cracker *SPECIAL* $20
Long-handled torx screwdriver and cover pry tool
Power Strip $20
Six outlets with surge suppression
Extension cable $19
Gives you distance from noisy printers, hard disk drives

Innovative Technologies
The Easel $14
Cloth case carries and displays disks
Pocket Pack $9

Kensington
Printer Stand $19
Polarizing Filter $20

Kette Group
MacNifty A-B Switch $27
MacNifty A-B-C-D Switch $45

MacHelp
MacHelp Reference Cards $12
Cards perch on Mac or keyboard providing quick reference. Choose from Jazz, MS-Word, Multiplan, Excel, MacPaint, or MacWrite.

MicroStore
Disk Book $22
Highest quality, notebook-sized carrier for 32 diskettes—made in U.S.A.
Small Disk Book $14
Holds 10 diskettes

Mountain Equipment, Inc.
Mac Carrying Case $79
The Best! Heavy-duty and stylish
ImageWriter Carrying Case $59

Mousetrak
9 x 11 Mouse Pad $9
7 x 9 Mouse Pad $8

DISKETTES

Sony 3½" (10) *SPECIAL* $19
The Best!
Sony 3½" (10) DS/DD $32

Code MW056

Icon Review

OPEN
MONDAY THRU SATURDAY
8 A.M. to 6 P.M. (Pacific Time)

ORDERS ONLY **800/228-8910**
CALIFORNIA **800/824-8175**

CUSTOMER SERVICE 408/625-0465
TECHNICAL SUPPORT 408/625-2158
NATIONAL ACCOUNTS 408/625-1957

ORDERING IS EASY!
Icon Review is dedicated to supplying top-rated software, same-day service, and discounted prices. Call toll-free, or order by mail.

OUR NATIONAL ACCOUNTS PROGRAM IS MADE TO ORDER.
Call today to find out how our National Accounts Program gives organizations like yours the benefit of Icon Review's unique brand of service and support. For more information call Brett LaSorella at 408/625-1957.

OUR POLICIES
- We accept MasterCard and VISA with no added service charge. Private and company checks accepted; for faster delivery send certified or cashiers check, or money order.
- No C.O.D.'s.
- We accept corporate or school purchase orders from qualified institutions. Call 408/625-1957 for details.
- California residents add 6% sales tax.
- All goods are new and guaranteed to work, but we do not guarantee machine compatibility. Due to software copyright laws, all sales are final. Defective products replaced immediately; call for a Return Authorization Number, 408/625-1931.
- We ship same day on most orders.

Save time or save money. For ECONOMY, we ship via UPS Ground. $2 minimum. Allow 2 weeks for delivery. We recommend EXPRESS, our standard shipping method via Federal Express Standard Air, $6 minimum. NEXT DAY service is also available via Federal Express Priority One. $25 minimum. SPECIAL SHIPPING: Alaska and Hawaii: Add 4% ($6 min.). Canada: Add 12% ($15 min.). FOREIGN ORDERS add 18% ($25 min.). All payments in U.S. dollars only.

Macintosh is a trademark licensed to Apple Computer, Inc. • Icon Review is a division of MindWork Enterprises, Inc. • MindWork and Icon Review are Trademarks of MindWork Enterprises, Inc. • Icon Review, Published by MindWork Enterprises, Inc. 6750 Mid Valley Center, Carmel, CA 93923. • © 1985 MindWork enterprises, Inc.

MAKE INFORMED DECISIONS

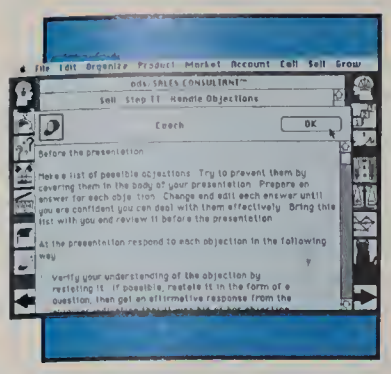
Our exciting new catalog offers you straight-forward reviews of more than 90 products. It keeps you up to date and protects you from risking your time and money on anything but the best. Ordering from us is the most convenient and reliable way to get the Macintosh hardware and software you need. It's also the most budget-friendly!

Icon Review Catalog

Call or write today and we'll send you a copy FREE.

Allow 3 weeks for delivery.

Circle 272 on reader service card



ods/ Sales Consultant $179

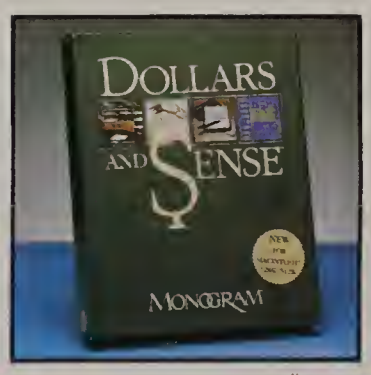
From Organizational Development

Ods/Sales Consultant is the dream-come-true product for outside sales people who would like top-notch organizational assistance. It helps you plan call strategy and presentations, budget your time, organize territory, learn products and develop account information. Its self-evaluation feature is like having a helpful sales manager at your beck and call, constantly increasing your motivation. It even includes an easy-to-use database. Everyone who sells (and we all do!) can benefit from ods/Sales Consultant. Get one and watch your income grow.

Fluent Laser Fonts $49

From Casady Company

Fluent Laser Fonts are elegant fonts for use on Apple's LaserWriter and other PostScript printers, including Linotronic typesetters. Laser Fonts offer Casady's superior craftsmanship that will show off your important text documents. Fonts are easily installed and come two per disk; they include: Calligraphy, SansSerif, Bodoni, Regency Script, Monterey, and Prelude Script. Fluent Laser Fonts are ideal for use in graphic arts and desktop publishing applications. They're compatible with PageMaker 1.2. Get Fluent Laser Fonts for the best output you've ever seen.



Dollars and $ense $82
Forecast $45

From Monogram

The brilliant Dollars and $ense will teach and carry out financial management. It will make easy work of client billing, balance sheets, credit card management, check writing, and checkbook balancing. It'll look into the future with "What If?" questions. Finally an efficient financial package that requires no prior computer training! Also offered is Forecast, a superb tax program you can use alone or with Dollars and $ense to plot tax strategy and minimize your federal income tax. When you buy both, you also receive the book, *Using Dollars and Sense,* a $15 value! That's minimal compared to the money you'll save by using these invaluable tools.

Icon Review Memory Upgrade

Good news! Your memory upgrade is already done! Just place your order, and we'll send you the upgraded board via Federal Express. Use the enclosed tools and instructions to open your Mac, swap boards, and you're up and running without even taking your Mac off your desk! The 120-day warranty outlasts Apple's upgrade warranty by a month. The two megabyte upgrades include a fan and contain PROMS that are reprogrammable to adapt to further system changes from Apple.

28K to 512K	$269
512K to 2 Meg	$659
128K to 2 Meg	$799

LoDOWN Hard Disk Drives

From LoDOWN

Here's our pick for the best SCSI drive for the Mac Plus! SCSI gives much faster performance than even internal hard drives on an old Mac 512K. LoDOWN uses the high-quality Lapine drive, and it is quiet. Its well-ventilated case needs no fan and contains a built-in surge suppressor! LoDOWN requires only the new HFS system with 5.1 Finder. You can use a cable up to 25 feet long, autoboot, and chain up to eight LoDOWNs for as much storage as you need. Available in sizes that fit your needs and prices that fit your budget!

LoDOWN SCSI Drives

10 Meg	$695
20 Meg	$895
40 Meg	$1795
80 Meg	$3495

ORDERS 800/228-8910
CALIFORNIA 800/824-8175

BUSINESS

Aegis
Doug Clapp's Word Tools *NEW* $45

Assimilation
Business Essentials $65

Blythe Software
Omnis 3 *SPECIAL* $245
Powerful relational database

Borland
Sidekick $45
Desk/phone/schedule organizer extraordinaire!
Phone Link & Sidekick *NEW* $59
Lets Sidekick dial for you

BrainPower
Power Math *SPECIAL* $52
Powerful symbolic equation solver
StatView *SPECIAL* $99
Excellent stat package—strong recoding and case selection
Statview 512 *NEW* $199
DesignScope *NEW* $149

Cricket Software
StatWorks $79
Great value with best statistical graphs

Electronic Arts
Financial Cookbook *SPECIAL* $32
Answers your financial planning questions

Equtron
MacBase *NEW* $79
East-to-use relational database with fonts

Execucom
Mindsight *NEW* $159
Business planning and decision analysis

Harris Technical Systems
Profit Projections/Breakeven Analysis $49
Quick analysis and graphics—easier than spreadsheets

Layered
Excel Notes *NEW* $59
Jazz Notes *NEW* $59

Living Vi[illegible]xt
ThinkTank 512 $99

Micro Pl[illegible] Software
MicroPl[illegible]er $315
Sophisti[illegible]ect management and schedulin[illegible]
MicroPl[illegible]r Plus $395
Enhance[illegible]on, requires 512K

Microsoft
BASIC $89
Chart $75
Excel $229
Fortran $179
File *SPECIAL* $112
Multiplan $107
Word *SPECIAL* $112

MindWork Software
MultiWrite *NEW* $79
NEW outliner with MacWrite compatible word processing and multiple document windows

Monogram
Dollars and $ense $82
Forecast $45
SPECIAL OFFER! Buy both and get "Using Dollars and $ense" book FREE! ($15 value)

Legisoft/Nolo Press
WillWriter *NEW* $27

Odesta
Helix 2.0 $CALL
Lowest price guaranteed! SPECIAL OFFER supply limited!
Double Helix $269

Organization Development Software
Consultant *SPECIAL* $109
Helps develop strategies, solve problems
Sales Consultant *NEW* $179

Paladin
Crunch *SPECIAL* $79
Includes Free Upgrade to SuperCrunch!
SuperCrunch $169

Personal Bibliographics
Professional Bibliographic System $199
Simplifies creating/maintaining properly formatted bibliographies

ProVUE
OverVUE 2.0 $149
Best balance of power and ease-of-use in databases
Mail Manager Template *NEW* $29
Personal Finance Template
Templates for OverVUE *NEW* $29

Real Data, Inc.
Overlay templates for Multiplan, Jazz and Excel
Tax Shelter Syndication Analysis $169
On Schedule $119
Real Estate Investment Analysis $89
Financial Analysis $62
Commercial/Industry Applications $62
Overlay templates for Excel
Property Management Level I $175
Mortage Qualifier $119

Satori Software
Bulk Mailer *NEW* $79
Enhanced version manages 40,000 names!

Softstyle
Decision Map *SPECIAL* $75
Innovative decision support and modeling.

State-Of-The-Art
Electric Checkbook *SPECIAL* $39
A bargain in personal finance

Telos
Business Filevision *NEW* $199

ACCOUNTING

Chang Labs
Rags To Riches
- **Acct's Pay.** *SPECIAL* $89
- **Acct's Rec.** *SPECIAL* $89
- **Gen. Ledger** *SPECIAL* $89
- **3 Modules** *SPECIAL* $229
(All the above)
- **Inventory** *NEW* $89

Micromax
Gallery Finance 3 Modules $169
Special Edition includes Cash Disbursement, GL, and either AR or AP
4 Modules $249
All of the above

Peachtree
Back to Basics
- **General Ledger** *SPECIAL* $89
- **Accounts Payable** *NEW* $89
- **Accounts Receivable** *NEW* $89

Sierra Information Systems
Accountants Choice
- **Accounts Payable** $259
- **General Ledger** $259
- **System Manager** $59
- **Demos (ea.)** $15

Professional small business accounting—hard disk required

Sierra on Line
MacOne Write
General Ledger $139
Cash Disbursement $139
Accounts Payable $139
Accounts Receivable $139

Softview
Mac-in-Tax '85 *SPECIAL* $49

GRAPHICS

Altsys Corp.
Fontastic Font Editor $25
Make your own fonts

Ann Arbor Software
Full Paint *NEW* $69
Same features as MacPaint PLUS opens up to four documents at once, includes stretch, rotate, and more!

Casady Company
Fluent Fonts *SPECIAL* $29
Fluent Laser Fonts *NEW* $49

Challenger Software
Mac 3D *SPECIAL* $99

Cricket Software
Cricket Graph *NEW* $139
Plots 20 times more data points than Excel!

Data Food
Draw Forms $30
Requires MacDraw
MacForms $42
Requires MacPaint

Enabling Technologies
Easy 3D *NEW* $79

Hayden Software
Art Grabber *SPECIAL* $29
VideoWorks $58
Astonishing visual effects!

Innovative Data Design
MacDraft *SPECIAL* $139
Most powerful drafting tool for the Mac

IO Design
Color Print *NEW* $25
Print your graphics in color!

Magnum Software
Slide Show Magician $39

Manhattan Graphics
Ready-Set-Go 2.1 $125
Best value in page processing—fast, flexible, and powerful!

Micro Spot
Mac Plot $139
Plotter drivers for Mac

Silicon Beach Software
Accessory Pak #1 $24
Cut and paste whole MacPaint pages and more!
Silicon Press $49
Makes color labels on your ImageWriter II

Softstyle
Colormate *NEW* $59
Print MacPaint and other documents in color on your ImageWriter II
Colormate Art *NEW* $29
Colorful clipart library
Plotstart *NEW* $79
Printworks *NEW* $49

Symmetry
Picture Base *NEW* $48
Organize your picture files for easy access!

T/Maker
Click Art Effects *SPECIAL* $29
Add tools to MacPaint
Click Art Letters *SPECIAL* $31
Click Art Personal Graphics $31

MUSIC

Assimilation
MIDI Composer $22
MIDI Conductor $75

Electronic Arts
Deluxe Music Construction Set *SPECIAL* $32

Great Wave
Concertware+ $39
An education in music
Concertware+ MIDI $39

Kette Group
MacNifty Studio Session $69
MacNifty Sound Digitizer $CALL
MacNifty Stereo System $59
Great sound for the Mac—includes speakers

Mark Of The Unicorn
Professional Composer $239

Opcode
MidiMac Interface $99
MidiMac Sequencer 2.0 $159
MidiMac Patch Librarian $59
MidiMac Patch Editor for DX/TX $99

Mirror Magnum 800K External Floppy Drive
From Mirror Technologies **$299**

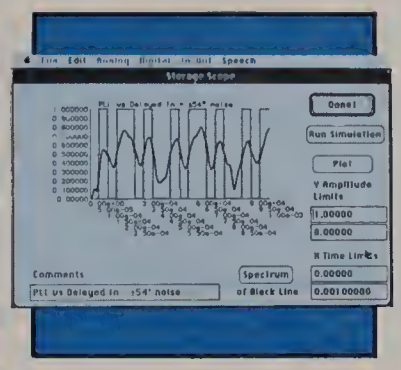
We think just about everyone is eager to double their floppy storage and access data 50% faster by upgrading to double-sided, 800K floppy drives. Wait no longer — the Mirror Magnum 800K external floppy drive is available today! It reads and writes both double-sided and single-sided disks. Compatible with both the old file system and new HFS from Apple, the Magnum works with the 64K or the new 128K ROM without any adjustments. We've evaluated several of the 800K floppy drives on the market and found this one from Mirror Tech to be of the highest quality. And at this low price, it's a super bargain as well! Carries a 90 day warranty.

Excalibur
From Assimilation **$499**

Excalibur is the most advanced Macintosh memory expansion you can buy. It's a two megabyte external RAM drive that is fully compatible with both Macintosh and Macintosh Plus computers. For speed and power this RAM disk is unbeatable. And it works silently since it has no moving parts. Plug it into the external drive port and you're ready; no software is needed. Excalibur offers an external port for use of other floppy or hard disk drives. It fits snugly underneath the Mac and it will give you the computing speed you deserve.

Fanny Mac
From Beck-Tech **$79**

People hate fans because of the noice, even though they know cooled computers experience fewer component failures. We've found Fanny Mac to be the quiet, elegant way to boost the ventilation in your Mac. *Quiet* because of its quality ball bearing fan. *Elegant* because of its design—it fits neatly, almost invisibly into your Mac's handle! Its "pass through" power assembly means you'll need only one power socket for both your Mac and Fanny Mac. And surge suppression for your Mac is built right in! Keep your Mac running cool while maintaining peace and quiet with Fanny Mac!



DesignScope
From Brainpower **$149**

DesignScope is absolutely the first electronic circuit-design simulation that you use before designing component circuitry. Use DesignScope's components including amplifiers, filters, voltage controlled oscillators, peak detectors, phased lock loops, and digital logic gates to create a perfect system without prior knowledge of component values. It works with analog and digital components, and is so easy to use that it encourages a trial and error approach that previously would have been labeled "unscientific." Anyone interested in engineering or electronics as a professional or a hobbyist should get this program at once.

THE Bag
From Caribbean Enterprises **$129**

THE Bag combines beauty and craftsmanship to offer the ultimate in Macintosh carrying luxury. Designed of buttersoft Colombian leather, the bag will cradle the Mac with style and protect every part safely in a padded interior. Inside are sturdy pockets for the mouse, keyboard, and external disk drive that remain closed when you want thanks to quality Velcro fasteners. An outside pocket offers convenient access to manuals, disks, and books. To carry THE Bag, use either handles or an adjustable shoulder strap. Doesn't your Mac deserve the most distinctive and durable carrying case? Don't you deserve THE Bag?

EDUCATION

Brainpower
Chipwits $29
Think Fast $21

Camde Corporation
Nutri-Calc $57

Davidson & Associates
Math Blaster $27
Speed Reader II $37

First Byte
Speller Bee *SPECIAL* $39
Kid Talk *SPECIAL* $39
Smoothtalker $49

Great Wave
KidsTime *NEW* $33

Hayden
SAT Combo Pack $59
With Math, Verbal, and PreTests

Mindscape
Perfect Score SAT $49

QED Information Services
Typing Made Easy $35

Rubicon
Dinner at Eight $35
Silver Palate Collection $29

Think Educational Software
Mac Edge II $29
Mac Edge Plus $29
Mad Mac and his Mind Box $29
Mind over Mac $29

GAMES

Ann Arbor Softworks
Lunar Explorer $39

Broderbund
Ancient Art of War $29
Knights, Archers, Cowboys, Indians, and more!

Electronic Arts
Pinball Construction Set $29

Hayden
Computer Novel Construction Set $29
Sargon III *SPECIAL* $27

Infocom
Cutthroats $24
Deadline $29
Hitchhiker's Guide/Galaxy $25

Sorcerer $27
Starcross $29
Wishbringer $24
Zork III $27

Miles
Harrier Strike Mission $29

Mindscape
Balance of Power $30
Match wits with the U.S.S.R. and prevent nuclear war!
Deja Vu $33

Psion
Psion Chess $39

Simon & Schuster
Paper Airplane Construction Kit $23

Spectrum Holobyte
Gato $25
Submarine simulation
Orbiter *SPECIAL* $30
Space shuttle simulator

DESK ACCESSORIES

Batteries Included
Battery Pak *SPECIAL* $29
8 helpful desk accessories

Cortland
Top Desk $39

Creighton Development
MacSpell+ *SPECIAL* $55
75,000+ words, thesaurus, and hyphenation

Dreams Of The Phoenix
12C Financial Calculator D.A. $29
Quick&Dirty Utilities, *1 or 2* $29

Dubl-Click Software
Calculator Construction Set $29
New low price!

Jam
Smart Alarms *NEW* $29
Integrates appointment book with alarms —flashes timely reminders for appointments

Target Software
MacLightning $69
THE Breakthrough design in spelling checkers

T-Maker Graphics
ClickOn Worksheet *SPECIAL* $47
Great for casual spreadsheet use

UTILITIES

Affinity Micro Systems
Tempo *SPECIAL* $79
Powerful macros with logic branching

Assimilation
Guardian $22
File encryptor
Mac Memory Disk $22
Mac Spell Right $69
Mac Tracks $22
Right Word $69
Work'N'Print $22
Print spooling software

Central Point Software
Copy II Mac *SPECIAL* $20
Includes hard disk install

FWB Software
Hard Disk Utility *SPECIAL* $59
Removes software copy protection to install on hard disk.

Ideaform
MacLabeler *SPECIAL* $29
Enhanced version!

Johnson Greene, Inc.
Spellswell *NEW* $39
New spelling checker catches capitalization & homonym errors too

Micro Analyst
MacZap $39
Hacker's back-up utility and more!

Nevins Microsystems
TurboCharger 2.0 *NEW* $39
New more powerful Disk Cache works with hard disks

New Canaan MicroCode
Mac Disk Catalog II *NEW* $39
Organizes your disk library

COMMUNICATIONS

Compuserve
Starter Kit $19
FREE with Hayes Bundle

Computer Friends
Mercury Modem $265
Hayes-compatible workhorse at a miracle price!

DataViz
MacLink W/8' Cable $109
Transfers and converts files between Mac and IBM

Hayes
Interbridge *NEW* $CALL
Smartcom II *SPECIAL* $89
Smartmodem 1200 *SPECIAL* $359
Smartmodem 2400 *SPECIAL* $579
Smartmodem-to-Mac Cable $18
1200 Smartmodem, Smartcom & Cable (Bundled) $449
We add FREE Compuserve Starter Kit!
Transet 1000 *SPECIAL* $279
Multi-function buffer and switch—incredible!
Transet 1000 512K *NEW* $379
Transet Mac Accessory Kit $29

Infosphere
MacServe $250
Partitions hard disk, network disk server, print spooler & more!

Prometheus
ProModem 1200 M $319
All options available —Call!

TOLL FREE

ORDERS **800/228-8910**

CALIFORNIA **800/824-8175**

$50.00 REBATE OFFER

MacTablet
From Summagraphics **$319**

MacTablet is the closest thing to a natural input device you can find for the Macintosh. It's ideal for graphics perfect for sketching or tracing and it's more precise and more comfortable to use than either a mouse or a trackball. In fact, it's not unlike the expensive graphics systems that have been available on large computers for years. It has a large work area, includes easy to use software, works with MacPaint and MacDraw, and has a resolution of 500 lines per inch. If you draw with a Mac you need MacTablet. Get MacTablet today and receive a $50 rebate direct from Summagraphics.

BUY FROM OUR NATIONAL ACCOUNT PROGRAM!

MacPalette

PRINTS IN COLOR ON THE APPLE IMAGEWRITER II

Install MacPalette™ on your application disk, then use the PRINT command to print in color from MacDraft®, MacDraw®, MacWrite®, JAZZ®, Chart®, MacProject®, and all other object orientated programs (not MacPaint®). MacPalette™ gives you the ability to mix an almost infinite number of color patterns.

BUY IT FROM YOUR DEALER TODAY!

For more information, phone CompServCo

1-800-272-5533

MacPalette is another Microspot quality product. Dealer inquiries are welcome.

MacDraw, MacWrite, MacProject, & MacPaint are ™ of Apple Computer. MacDraft is a ™ of Idd, Inc. JAZZ is a ™ of Lotus. MacPalette is a ™ of Microspot.

Circle 458 on reader service card

(continued from page 51)

It's All Here in Black and White

Like some of Apple's marketing strategy, David Bunnell's January 1986 column hit the target but missed the bull's-eye.

The fact is that routine business communications produced on paper must be printed in black and white.

The reason: there's no practical way to routinely make 20 or 10 or even 3 copies of anything in color. Period.

When the end product is to be in black and white, no competitor can touch the Mac's flexibility and sophistication.

Roger Oliver
St. Louis, Missouri

While there is still nothing as fast as a Xerox machine for printing color Mac documents, the new ImageWriter and NEC's CP2 printer do generate color printouts (see "Color Commentary," Macworld, *January 1986).—Ed.*

A Yen for Accuracy

In the article "One Day in the Life of Japan," which appears in the January issue of *Macworld,* you have added one too many zeros to the yen amounts or one too few to the dollar amounts. No way are there 2250 yen to the dollar! The dollar has been strong lately, but not that strong.

I'm glad that the person who figured the currency conversions for the article doesn't work in the bank where I change my yen to dollars.

G. F. Lukos
Arlington, MA

In this case our mistake resulted from failing to follow the proofreader's maxim "Check and double-check." We transferred our Macintosh text files—which showed the correct yen values of ¥5000 for a pound of tuna or an hour in the hotel—to the IBM PC WordStar *files that our typesetter requires. However, the yen symbol (¥) that is available on the Macintosh keyboard does not translate directly, because there is no such symbol on the IBM keyboard. The IBM interpreted the code for the yen symbol as 4, probably by reading the first few bits of the ASCII code for the symbol. If you transfer files, keep an eye out for such unexpected results.—Ed.*

(continues on page 58)

Drive *16* Macs *50* Times Harder

20 Meg External for Mac Plus + 512k

The MagNet™ 20x MultiUser External Hard Drive

The Mac Plus and 512k Solution

Mirror Technologies MagNet 20x™ offers speed, portability and great software to provide you with the most powerful single or multiuser hard drive available. The MagNet 20x™ plugs straight into your Mac Plus SCSI port or with our FastPort™ option you can inexpensively get "Plus" performance out of your 512k.

Rugged Design/One Year Warranty

The MagNet 20x™ hard drive is specially designed to withstand treatment that would "crash" the competition. The patented drive head lifter in the MagNet pulls the read/write heads away from your precious data upon power off. This means large storage and high confidence are not mutually exclusive.

Midget Size, Monster Performance

The MagNet 20x™ is packed with features. Our software allows multiuser access, print spooling, disk cache, password protection for files, volume partitioning, multitasking and full or incremental backup of your data. What all this technical jargon means is that as your computing needs grow the MagNet 20x™ has the power built in. No upgrades necessary, it's *all* there.

We Give Great Software

MacServe™ from Infosphere™ is included with every MagNet 20x™... free. A $250.00 value. MacServe includes great single user features but also allows multiuser access to your Mac. Imagine the value of sharing data and peripherals with other Macs in the office. Don't spend money on unnecessary printers and hard drives. The MagNet 20x™ will make the most of the equipment you already own.

Mac Plus Power for your 512k?

With our FastPort™ option you can add the speed and SCSI capability that the Mac Plus has to your existing 512k without replacing your motherboard. The FastPort™ installs easily with no modifications to your Mac. FastPort™ is also inexpensive, you can have the performance and speed of the Mac Plus for less than one-fourth the price of the Apple upgrade.

What Price Power?

A lot less than you would expect... Hundreds less than the HD 20. Mirror Technologies designs storage devices exclusively for the Macintosh. This is why we can offer so much value for so little money.

The Macintosh drive experts.

MIRROR TECHNOLOGIES Inc.

2209 Phelps Road
Hugo, Minnesota 55038
612-426-3276

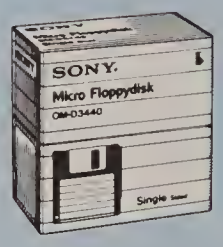
Apple and Macintosh are registered trademarks of Apple Computer, Inc. / MagNet 20 is a registered trademark of Mirror Technologies Inc.

Circle 406 on reader service card

FREE FREE

Disk Bank or Sony Videotape
with purchase of
Each 30 SONY (Labelled) Diskettes

Because your MAC Deserves the Best...



SONY®

Boxed in Tens

3.5" SS..... **1.65 ea.**
3.5" DS..... **2.55 ea.**

Minimum order — 20 Diskettes — Quantity Discounts Available

Stores and files 30 3.5" disks —

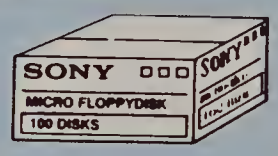
$8.95 Each or **FREE** with purchase of Each 30 SONY Labelled Diskettes.

SONY L-750 or T120 Blank Video Tape a $5.95 Retail Value, **FREE** with purchase of Each 30 SONY Labelled Diskettes.

Best Presents — the "Mac Pac"

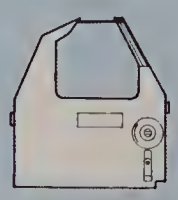
Boxed in 50's	*3.5" SS*	*3.5"DS*
50 Piece "Mac Pac".....	**1.55 ea.**	**2.35 ea.**
100 Piece "Mac Pac"...	**1.52 ea.**	**2.30 ea.**
400 Piece "Mac Pac"...	**1.49 ea.**	**2.25 ea.**

No FREE Disk Bank or Sony Videotape with "Mac Pac".



SONY

Perfect Data 3.5" Head Cleaning Kit
Good for 26 Cleanings
11.95



Imagewriter Ribbons
Black (2-11) **3.95 ea.** (12+) **3.35 ea.**
Colored (2-11) **4.95 ea.** (12+) **4.35 ea.**
Rainbow (6-Pack) **26.10 (4.35 ea.)**
Red, Green, Blue, Brown, Yellow and Purple

Compugard
CPP-2 w/surge
29.95
CPP-12 w/surge & Noise **39.95**

TO ORDER 1-800-351-BEST
CALL TOLL FREE 1-800-451-BEST (in California)
For Information call 1-408-559-9339

Best COMPUTER SUPPLIES
457 McGlincey Lane #4
Campbell, CA 95008
(408) 559-9339

Visa, Mastercard, C.O.D. or Prepaid. Corporations rated 3A2 or better, government agencies and schools may send in purchase orders on a net 30 basis. Minimum order $25.00. Shipping charges are $3.00 per 100 diskettes or fraction thereof (within the continental U.S.), APO, FPO, AK, HI and PR Orders add 10% to cover PAL and Insurance. C.O.D. Orders Add $4.00. No Sales Tax outside California.

Satisfaction guaranteed on all products.

Circle 373 on reader service card

(continued from page 56)

Omission Accomplished

After reading *Macworld*'s special winter edition, I was distressed to find that our product—MacFORTH—was not included in the "Business Software Review" list. What happened?

Christine Colburn
Rockville, Maryland

We apologize for the oversight. With more than 400 business programs to categorize, we were bound to miss a few. Readers who would like information on MacFORTH should contact Creative Solutions, 4701 Randolph Rd. #12, Rockville, MD 20852, 301/984-0262.—Ed.

Filing Fault

The recent article on *Helix* ["Files of Icons and Tiles," November 1985], the relational database system produced by Odesta Corporation, was certainly all-inclusive, but only of the program's positive attributes.

No mention was made within this six-page report of any of the disadvantages of this program, such as its significant inability to save calculated fields. Because of this drawback, it is impossible to produce three-across mailing labels, which is an amazing deficiency in such a sophisticated system. *Macworld* should feel a need to provide for its readers not only the pluses but also the minuses of featured programs.

Dave Edmiston
Sacramento, California

Perhaps you have an early version of Helix. *We reviewed version 2.0, in which you can post calculated fields. Although not as convenient as some other programs, such as* OverVUE, *which lets you choose the type of labels from a menu, you can produce three-across mailing labels within a* Helix *template icon. Simpler file management programs are generally better suited to mailing applications than a data analysis program such as* Helix.—*Ed.*

Letters should be mailed to Letters, Macworld, *555 De Haro St., San Francisco, CA 94107, or sent electronically to CompuServe 70370,702 or The Source BCW440. We reserve the right to edit letters. All published letters become the property of* Macworld. □

20 Meg Internal for Mac Plus + 512k

Drive *16* Macs *50* Times Harder

The MagNet™ 20 Meg MultiUser Internal Hard Drive

The MagNet 20™ Hard Drive

Mirror Technologies introduces one of the most powerful Macintosh hard drives available. The MagNet 20 combines great value, expandability, speed and portability to give your Mac amazing capabilities.

This Internal Hard Drive Is Fast And Portable

Mirror Technologies has teamed up with Infosphere, to develop a special version of MacServe.™ (XL-Serve, the predecessor of MacServe, is the **most** popular AppleTalk™ network software in the world!) MacServe software adds all of the capabilities and features of the best Mac hard drives available today, plus the ability to share peripherals, programs and data with multiple computers. As your needs grow the MagNet 20 already contains the power and versatility to handle your computing to go.

Packed With Features

The MagNet 20 allows you to print spool, disk cache, protect files with passwords, partition volumes and fully or incrementally backup your data. The MagNet 20 is the most powerful single or multiuser storage solution available today.

Rugged Design/One Year Warranty

The MagNet 20 uses a hard drive specially designed to withstand treatment that would "crash" the competition. The patented drive head lifter in the MagNet 20 pulls the read/write heads away from your precious data upon power off. This means you and your Mac can travel with confidence.

The Powerful Single User Solution

Purchase the MagNet 20 as a **very** powerful single user drive and simply add the inexpensive AppleTalk network cables to allow multiple Macs to access shared programs, data and peripherals!

Multiuser Capability at a Single User Price

Stop in at your nearest Apple authorized dealer for a demonstration of the MagNet 20.

Drive *16* Macs *50* times harder.

MIRROR TECHNOLOGIES Inc.

2209 Phelps Road
Hugo, Minnesota 55038
612-426-3276

Apple and Macintosh are registered trademarks of Apple Computer, Inc. / MagNet 20 is a registered trademark of Mirror Technologies Inc.

Circle 406 on reader service card

You Can't go Wrong with MacLightning.™

MacLightning™ is the first RAM-based interactive Spelling/Grammar checker for Macintosh.™

Whether you're using Microsoft Word,™ Excel,™ MacWrite,™ Jazz,™ or any other Macintosh program, MacLightning watches your every move and beeps when you make a mistake.

Once alerted to an error, you can find the correct word by hitting one key. And correct it the same way. Or if you'd rather check your work at the end of a session, MacLightning will check a section or an entire document with a click of the mouse. With a top speed of 60 + words per second, it's the fastest road to a perfect document.

MacLightning remembers the words that are important to you. Any word, name, place or abbreviation can be added to the Dictionary with a single click. And that's not all!

Soon you'll be able to add additional Data Libraries such as encyclopedias, medical, legal and scientific references and technical dictionaries. Just choose the Library you need, and it's business as usual . . . without the mistakes!

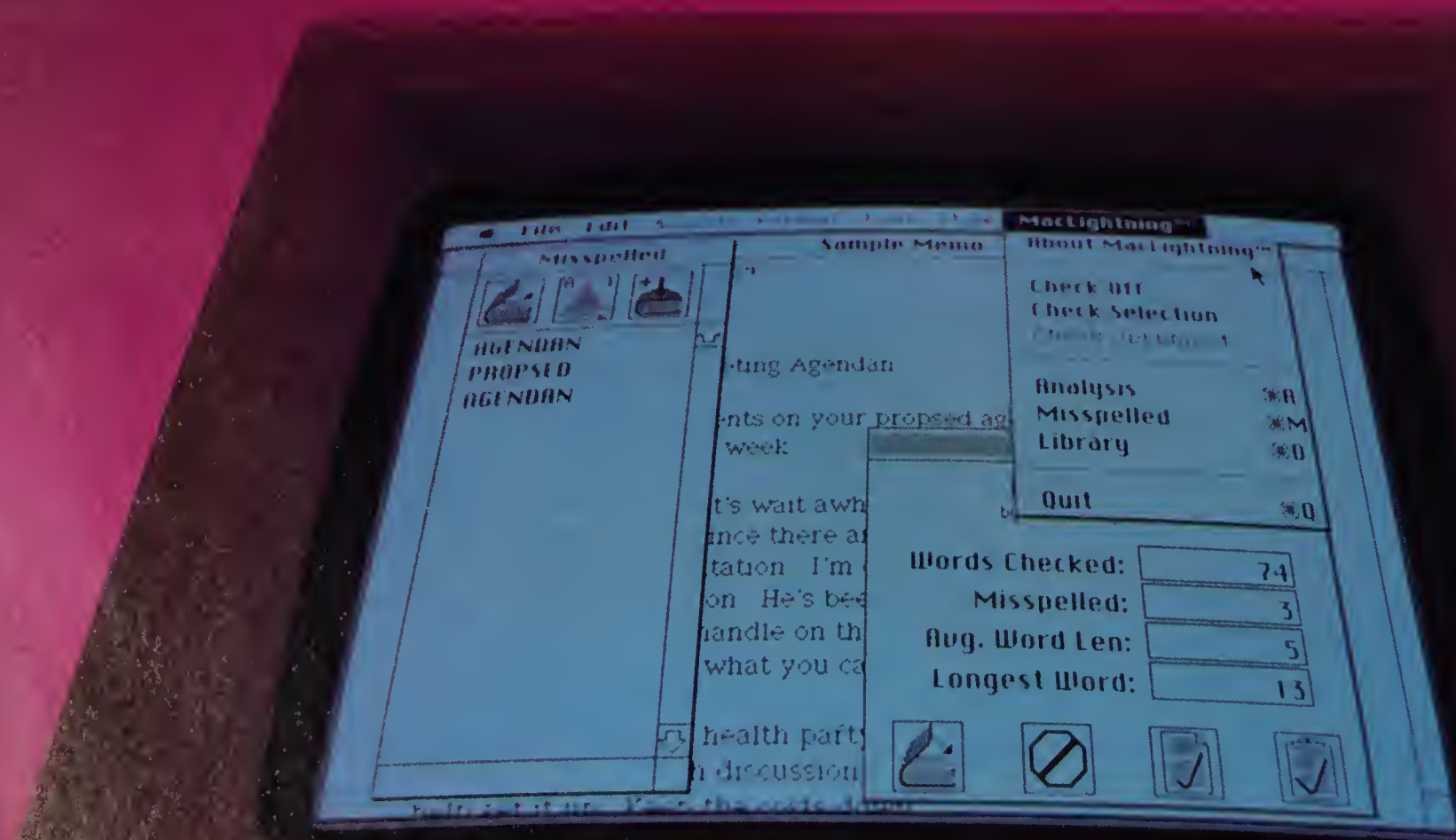
So before you go wrong, stop by your local dealer and go right with MacLightning™!

Requires 512K Macintosh. $99.95
call for the location of the dealer nearest you.

MacLightning

From Target Software, Inc.
14206 S.W. 136th St., Miami, Florida 33186
In Florida: 305/252-0892, Nat'l. 1-800-MAC-LITE

Circle 478 on reader service card



INTERLACE
THE MACINTOSH DATABASE

INTERLACE™ COMBINES RELATIONAL DATABASE POWER WITH THE EASE OF USE OF A FILE MANAGER

Simple filing products though easy to use, lack the power to handle multiple-file applications and the calculations required to perform useful tasks.

Most power databases require that you become a programmer before even the simplest task can be done.

But now Interlace is here...

LINK DATA IN MULTIPLE FILES

Interlace is the only program which allows you to visually define your database by drawing connections between files. **Adam Green, Infoworld:** "...Really uses the visual strength of the Mac to produce a database design tool."

VISUALLY DESIGN FORMS AND REPORTS

Report design is freeform, place fields and pictures anywhere on the page. Choose your own fonts and styles. Reports can access multiple files and other reports using spreadsheet-style formulas to build practical applications. **Stewart Alsop, PC Letter:** "...Bridge(s) the gap between the pretty programs and the power programs."

INCLUDES THESE POWERFUL APPLICATIONS

- Client Billing
- Stock Portfolio Management
- Checkbook
- Parts Explosion
- 1040 Tax planning including Schedules A, B, and D.

Esther Dyson, Release 1.0: "Interlace is a stunningly wonderful application generator/dbms."

Suggested retail price is $139. Order now and get Interlace at the special introductory price of $95. Backed with a 60 day money-back guarantee.

Call **(800) 626-8392**
or in CA, **(800) 826-1585**

Singular SOFTWARE™
5888 Castano Drive
San Jose, CA 95129.

Send me **Interlace for the Introductory price of $95** (plus $4.00 shipping. Canada $10). Overseas add $25 and make payment by bank draft, payable in US dollars, drawn on a US bank. COD's and Purchase Orders WILL NOT be accepted.

Name: _____

Company: _____ Phone: _____

Address: _____

City: _____ State: _____ Zip: _____

☐ Visa ☐ MasterCard Card #: _____

Card Expiration Date: _____ Signature: _____

California residents add 7% sales tax. **DEALER INQUIRIES WELCOME**

Interlace is a trademark of Singular Software, Inc. Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 420 on reader service card

STARE AT THIS FOR 18.5 SECONDS. THANK YOU. YOU'VE JUST DEMONSTRATED THE BEST REASON TO OWN A HYPERDRIVE.

It takes 18.5 seconds to start MacWrite on a regular 512K Macintosh. And only 5.5 seconds on the world's fastest Macintosh—namely, one with HyperDrive. (Which will work with either the 512K Mac or the Macintosh Plus.)

To demonstrate the second best reason to own a HyperDrive, stack fifty diskettes atop one another. HyperDrive holds up to that much data without enlisting outside help from any diskettes at all.

The next demonstration will require a little imagination. Imagine a Macintosh with software that protects your data against loss by copying it onto diskettes. A print spooler that lets you go on to other jobs while your printer is occupied. And a security program that protects your files from unauthorized entry. You've just imagined a Macintosh with HyperDrive.

The next demonstration requires no imagination at all. Just stare at your Macintosh. Since HyperDrive is the first hard disk that's installed inside the Mac, it also preserves the Mac's appearance and portability.

But for the most convincing demonstration of all, just perform this simple operation: Visit an authorized General Computer dealer. He'll show you all the reasons why HyperDrive is, in the words of Macworld, "the happiest marriage of the Macintosh and a hard disk."

For details, call us at (800) 842-9000, Ext. 7, or (800) 843-9090, Ext. 7.*

GENERAL COMPUTER

The leading edge starts here.

*In Canada, call our distributor at (800) 565-1267. ©1986 General Computer Corp. HyperDrive, the General Computer Corp. logo and The leading edge starts here are trademarks of General Computer Corp. Apple and MacWrite are trademarks of Apple Computer, Inc. Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 143 on reader service card

Macworld View

Software entrepreneurs join forces, the Mac ends cramming at vet school, and more

Daniel Farber

Animal Farm

Out in the flatlands of east central Mississippi, far from the civilizing influence of the great river, amidst mountains of kudzu and acres of dairy farms, is Mississippi State College. You're forgiven if you don't think of Mississippi–especially Starkville, where the college is located–as a hotbed of Macintosh innovation. But think again. The Macintosh is making inroads in all corners of this country, and Mississippi is one of those corners.

Mississippi State has the first veterinary school in the country to require Macintosh computers (or, for that matter, computers of any kind) of its entering students. For the past two years, entering classes at the sleek, multimillion-dollar facility have brought Macs with them to their dissection classes. The school is developing an innovative approach to medical education that may become a model for other schools. Instead of focusing primarily on the development of courseware, Mississippi State has opted to use the computer in education for something for which it's uniquely suited–as a diagnostic database.

"This is a new college–it was founded in the late seventies–so when we set out to design the curriculum, we weren't limited by the past," explains Dr. Philip Bushby, a professor at the school and the prime architect of the computerization scheme. "We took a hard look at the curriculum expected of a veterinary student to pass the national boards. We realized that there were 216,000 facts that candidates were expected to master–that's one new item every 6 minutes, 24 hours a day, for the first three years of the four-year program. And that's just today. What about in ten more years?"

The faculty and administrators concluded that the knowledge explosion required a rethinking of the goals of education. "We realized we could no longer eliminate ignorance but should try instead to teach our students how to deal with their ignorance," say Bushby.

A veterinary student takes symptoms straight from the horse's mouth and records them on the Mac to arrive at a diagnosis.

"And using the Macintosh as a knowledge repository, with upgraded disks of information going out to vets as an ongoing, lifelong process, is the way we're looking at the computer age."

(continues on page 65)

How To Make Your Maccing Faster, Easier, and a Lot More Fun!

Tempo macros speed your work or play on the Macintosh.

Record any series of Macintosh commands or keystrokes and Tempo will play them back, at top speed, every time you need them. With a single key code, you can execute a macro that replays an unlimited number of commands.

Add intelligence to your Macintosh software

If a macro needs to be performed 27 times in a row or every 15 minutes, Tempo will do that. If it depends on whether a number starts with a "$" or if a name is greater than "Jones," Tempo will read it and decide which way to branch. Tempo can even determine if it needs to *branch to another program.* Tempo will close the program you're in, open the other, and continue replaying your commands. Automatically. Exactly as you require.

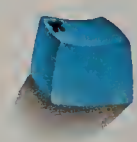
Intelligent macros for the Macintosh.

Edit your macros for changes or corrections

You may edit Tempo macros the same way you create them – click to edit, click to change, click to save. Tempo has no complex programming language, simply step-by-step menu commands and dialog boxes.

What you can do with Tempo

- Reduce complex commands to a single keystroke.
- Automate moving information from one program to another.
- Have Tempo wait until the time you specify, then perform multiple tasks on your Macintosh – unattended.
- Guide new users through programs, prompting them with dialog boxes along the way.
- Distribute time-saving macros to other members of your company.
- Customize programs to work the way you need them to.
- Simplify, automate, customize, modify, design, and create in a million different ways!



Other Tempo features...

- Pause during a macro replay to enter text or make a selection.
- Record macros up to the limits of your disk space – hard drive or floppy.
- Assign up to 450 keyboard commands in each application.
- Use Command key codes or Option key codes.
- Replay in slow motion, in real time, or at high speed.
- Connect macros together, nested, branched or sequentially.
- Repeat the macro *if* or *until* it sees the specified text, or *for* a required number of times.
- Tempo works with nearly every Macintosh program.
- For the 512K or larger Macintosh and Macintosh XL.
- Works with all hard disk drives.
- Tempo is not copy-protected, so you can easily install it on your hard drive.
- If you're not absolutely happy with what Tempo can do for you and your Mac, return it within 90 days for a complete refund.

We guarantee your satisfaction.

For $99, you get more macro power than a micro has ever had before.

Call 1-800-255-5550 x425 right now, today!

Call us for the dealer nearest you, or you can order directly from us.

Tempo™

Affinity Microsystems Ltd.
1050 Walnut Street, Suite 425
Boulder, Colorado 80302

Macintosh is a trademark licensed to Apple Computer, Inc. Tempo and Affinity are trademarks of Affinity Microsystems, Ltd.

Circle 274 on reader service card

Animal Farm (continued)

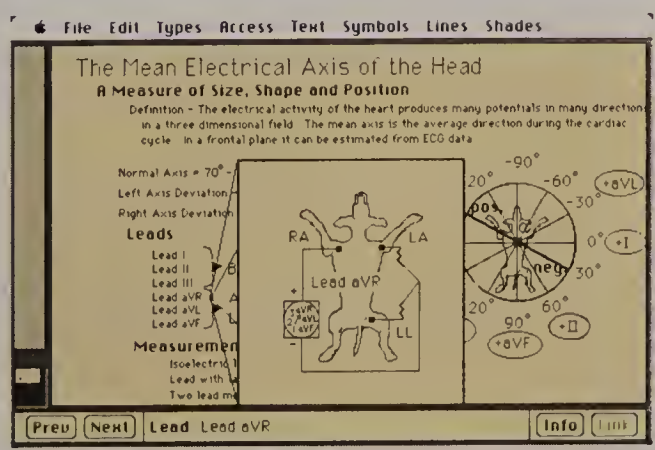
The key item in Mississippi State's scheme is a kind of expert system designed for medical purposes called the Problem Knowledge Coupler, or PKC. The program involves a querying database approach that is structured to allow doctors to answer yes or no diagnostic questions about an animal's health. After the doctor answers the questions, PKC lists possible diagnoses, along with statistical information showing how closely each possible diagnosis matches the animal's symptoms.

One important advantage of the PKC is that the diagnostic modules can include extremely rare diseases that only a specialist would catch—and put that knowledge into the hands of every generalist.

The diagnostic modules are developed one at a time and then sent out to working vets on disks. The long-range goal of the school is for all the vets in the state (and ultimately the country) to use Macs with hard disks running the PKC program. Information can be added to diagnostic modules as it is developed, and updated versions of a module can be sent out as needed.

As far as courseware goes, *Filevision* and *FactFinder* are popular with a number of the professors, and many of the anatomy classes use *Filevision* documents that have been created in the past two years. *Filevision* is ideal for storing the mix of anatomical charts and data required of a vet. Throughout the freshman and sophomore labs—big, open rooms with lockers, dissection tables, and cubicles—Macs can be found built into custom-designed stands. Students work on dissections with *Filevision* pictures nearby on their Mac screens, referring to the documents that other classes have produced and which are now part of the college's library or creating new files as class assignments. The project has been so successful that one of the professors, Dr. Nelson Westmoreland, has won several awards from Telos, the maker of *Filevision,* for his anatomical database applications.

What is especially impressive about the Mississippi State operation is that it was developed outside of the Apple University Consortium—Apple's college program. A single college with only 40 students per class and a few hundred in all, Mississippi State has nowhere near the numbers required for the consortium. But that hasn't stopped the veterinarians, and Mississippi State is now being visited by representatives of other schools from around the country. Presently discussions are taking place on how best to distribute the Knowledge Coupler modules that several schools besides Mississippi State are planning to produce.
—Jeffrey S. Young



Veterinary Courseware
At Mississippi State's veterinary school, Business Filevision *is used to provide electronic databases of anatomic and medical information.*

Television producer Bob Fraser on the set of "Benson."

Television Storyboards

Bob Fraser, producer of TV's "Benson," admits to being inspired by the *Macworld* issue devoted to the Macintosh and the movies (March 1985). But he has gone far beyond using the Macintosh for writing and scheduling. He now employs a video camera, a digitizer, and Hayden's *VideoWorks* to create animated storyboards and presentation graphics.

"Drawing storyboards used to be one of the most difficult parts of my job," says Fraser. A storyboard is a set of drawings showing individual camera setups—the first step in visualizing a script. Before the Macintosh, Fraser drew rough sketches with stick figures and then gave the sketches to an artist for another rendering. "Often the sketches went back and forth between myself and the artist several times until I got what I wanted," says Fraser. "It was a mess."

Fraser started out with one Macintosh and an Imagewriter, writing scripts with *MacWrite,* charting the status of each episode with various programs, and drawing storyboards with *MacPaint* and *MacDraw.* He soon added the digitizer and learned to use it with both a video camera and a videocassette recorder. "I freeze-frame any image I want from the VCR and use the Macvision digitizer to transfer the image to the Macintosh," explains Fraser. "That way I can create storyboards with realistic backgrounds and characters."

The producer and former actor and theater manager now owns three Macintoshes: one for home, one for the office, and another for his two grade-school daughters—"To keep them away from mine at home." Fraser has also added an Apple LaserWriter to his system. For mass storage, he's attached a 5-megabyte Bernoulli box to his home system. But the final piece in the puzzle of creating realistic animation is *VideoWorks,* from Hayden.

"That program really allows smooth animation. Now I can

(continues on page 67)

New
Faster Version 2.1

The most BASIC.

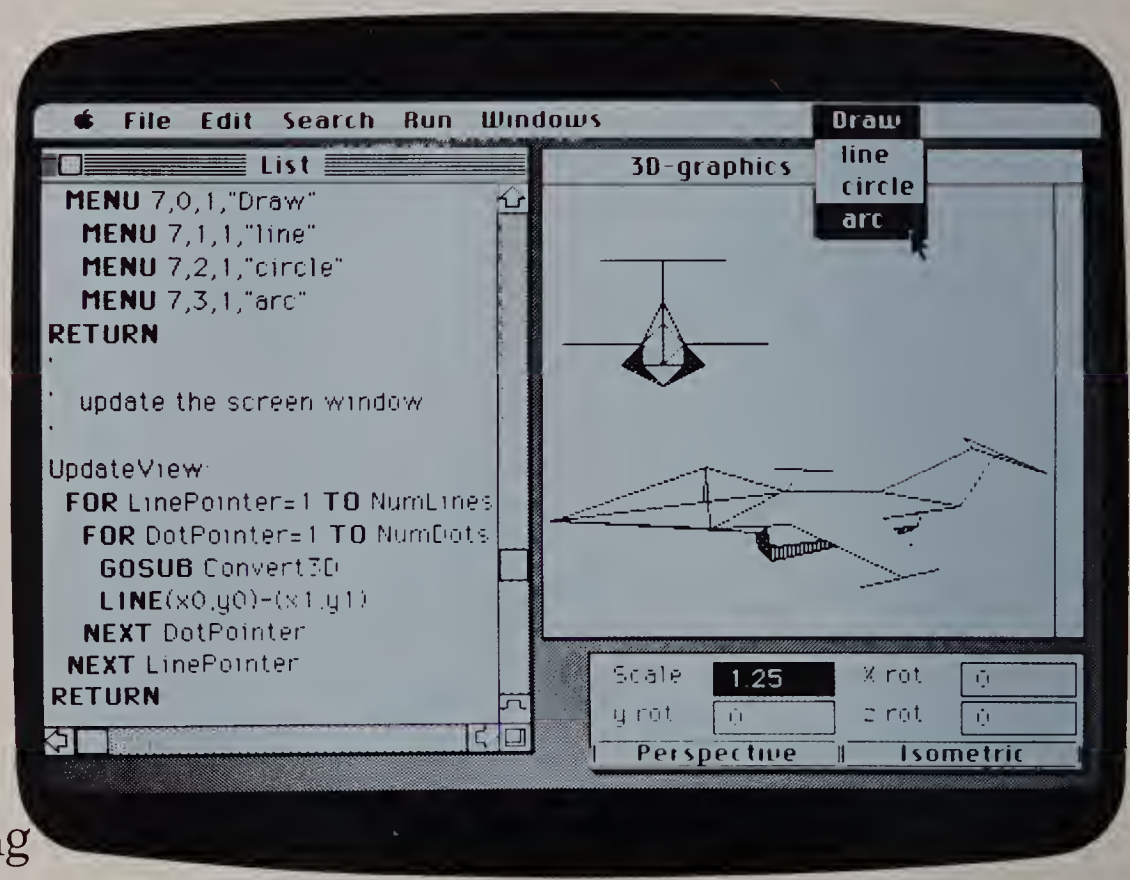
Microsoft® BASIC is the language spoken by nine out of ten microcomputers worldwide. It's the language with the most programs written for it.

So if you want to access the power of your Macintosh,™ only one language makes the most sense. Mac's first language, Microsoft BASIC.

Not only is it the industry standard, it's the most advanced BASIC for Macintosh. It lets you add mouse commands. Graphics. Windows. Change type fonts and styles. Customize menus. Incorporate music and sound effects. Write your own dialog boxes. Basically, it lets you take advantage of everything that makes Mac 'Mac.'

It makes editing programs as easy as cutting and pasting and pointing and clicking. Debugging is easier than ever with the advanced trace command.

It's no wonder Microsoft is the most logical choice for the Macintosh.



MICROSOFT®
The High Performance Software™

We've written more Macintosh programs than any other software company. Including Mac's spreadsheet, Multiplan.®

So if you want to get the most out of your Macintosh, call (800) 426-9400. In Washington State and Alaska, call (206) 882-8088. In Canada, (416) 673-7638.

Microsoft and Multiplan are registered trademarks and The High Performance Software is a trademark of Microsoft Corporation. Macintosh is a trademark licensed to Apple Computer, Inc.

Television Storyboards (continued)

create animated storyboards, and everyone can see the movements they have to make," says Fraser. His future plan is to use an animation program with zooms and lots of different screens to make presentations to the networks. "I'll let the Macintosh make the pitch for us. I can't really say, 'We are the brilliant writers who brought you so-and-so,' but the Macintosh can."–*John Vornholt*

Smurfs

Chris Miles is the director of the Leisure Recreation Planning and Design Division of Helman Hurley Charvat Peacock Architects in Orlando, Florida. Miles and his division have been involved with the design and construction of several major recreation centers, including the American Adventure Pavilion at the Walt Disney World EPCOT Center and the Shamu Stadium at Sea World in Orlando, Florida. The team's latest undertaking is a $200 million theme park much like Walt Disney World in France's Lorraine Valley, and the Macintosh has become an integral part of the project.

The prodigious design documents, drawings, and correspondence for the project, in both English and French, are created on the Macintosh and communicated via modem from Orlando to a French management group's office Macintoshes in the Lorraine Valley. Decorating the thousands of pages of technical documents are *MacPaint*-generated Smurfs, the peace-loving dwarfs who have become Europe's most popular cartoon characters. The Smurfs are the main characters in the theme park, dressed in space suits to illustrate the park's name, *Le nouveau monde des schtroumpfs*–The New World of the Smurfs. Scheduled to open by 1989, the theme park will combine high technology with rides, shows, and theme environments.–*K. T. Haase*

Chris Miles with his model for a Smurf (or schtroumpf *as they say in France) theme park in the Lorraine Valley.*

Software Entrepreneur's Forum

So you've finally created a great piece of software. You've spent every night and most weekends slaving away on your Macintosh to produce the little gem, and now dreams of making a living as a free-lance software developer are floating through your mind. Your mom says it's terrific, and all your friends are impressed, so what's next? How to bring that jewel to the marketplace?

Unless you've got venture capital and an experienced sales and marketing team, you're probably going to need help. And that's where a group like the Software Entrepreneur's Forum (SEF), of Palo Alto, California, can help. This three-year-old organization is dedicated to providing the independent software developer with "an educational forum for developing marketing strategies, exchanging information, and building professional relationships." What that translates to is a monthly general dinner meeting with various industry figures and special-interest groups focusing on specific topics.

And it's as good a chance to pick the brains of other free-lance developers and entrepreneurs as you'll find. Does direct mail work? Which are the best publications for placing ads? What about legal disclaimers and protection? Is public relations worth the money? How do you convince retailers or distributors to carry your product? Who is the most reliable disk copier?

At the moment the SEF is located only in Silicon Valley, and while the newsletter can be sent anywhere in the world, it's the face-to-face meetings that are of most value. Similar groups have sprung up around the country: in Seattle there's the MicroComputer Marketing Forum, while some of the larger user groups, such as the Boston Computer Society, have software developers' and business groups. The state of Minnesota has recently inaugurated a Software Education Office for Developers. Perhaps developers' groups will become a trend. The SEF is considering starting chapters in different parts of the country. If there's enough interest in your area, get in touch with them–they'll help. Software Entrepreneur, P.O. Box 61031, Palo Alto, CA 94360.–*Jeffrey S. Young*

Computer Recreations

One of the great features of the magazine *Scientific American* is A. K. Dewdney's monthly "Computer Recreations" column. I've always enjoyed his imaginative and often unusual explorations. Curious but computerless readers find much to savor, but only computer owners can experiment with the concepts and programs into which Dewdney delves. Fortunately for Macintosh owners, the subjects of many of Dewdney's columns have been turned into programs for the Mac and placed in the public domain–on CompuServe and

(continues on page 69)

Introducing inTouch

Communications Task Master from Palantir® Software

Save What You Want When You Want

With inTouch, any time during a session, you can decide to save something. Even if it's not on the screen, you can go back and get it from the scroll buffer.

Complete Protocol Support

MacBinary, XModem, and Crosstalk protocols for Mac-to-Mac, Mac-to-Host, Mac-to-IBM PC, or Mac-to-Whatever.

Electronic Mail - Today's Post Office

Send and receive mail from MCI, EasyLink, Dialcom, and the Company mainframe. Create messages with the built-in memos editor.

VIDTEX Emulation

Now you can see Compuserve's weather maps, stock price charts,or the FBI's Ten Most Wanted.

Communications Command Language(CCL)

Automated or unattended operations day or night. Set up a series of commands, and have them all done, one after the other -- all unattended. No problem.

Onscreen Function Keys

Onscreen programmable function keys allow you to customize your communication needs. Clicking on a key sends text, executes a CCL program, or displays another row of function keys.

Heralded Documentation

Learn by example from over 40 CCL files. Examples are provided to automate communications with EasyLink, MCI Mail, Dow Jones, Dialcom, Compuserve, and The Source. Creating your own CCL files is easy with inTouch.

FINANCIAL SERIES

General Ledger

Complete Double-Entry Accounting. A Chart of Accounts is provided, or create your own. Customize reports. Full financial statememts provided.

Accounts Receivable

Allows Balance Forward, Open item, or a combination of the two. Generates statements and period aging. Flexible sales analysis reports.

Inventory Control

Control your stock with movement reports, re-order lists, purchase order tracking, and complete iventory item status reports. Full pricing lists too.

EDUCATIONAL SERIES

MacType®

Dvorak or QWERTY keyboards. Structured exercises to increase typing speed. Options include metronome, speed & accuracy box, student tracking, and much more.

MathFlash™

Four-function math flash card system. Timed drills on any combination of adding, subtracting, multiplication, or division. Progress awards, and student tracking.

WordPlay

Crossword puzzles, from easy to advanced, including diagramless. Play the puzzles included on disk or create your own and print them out.

PALANTIR® SOFTWARE

PALANTIR®
SOFTWARE

PALANTIR® SOFTWARE, 12777 Jones Road, Suite 100, Houston,Texas 77070, For Information: 713-955-8880, To Order: US (800) 368-3797, TX (800) 831-3119, CN (800) 235-0025

Circle 387 on reader service card

Computer Recreations (continued)

elsewhere–by generous "Computer Recreations" readers.

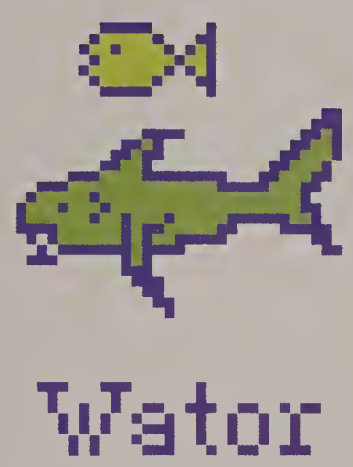
One of my favorite Dewdney recreations is *Core War,* which was described in the May 1984 and March 1985 columns. *Core War* is a war game simulation in which specially designed programs try to destroy one another. *Core War* for the Mac, written by Robert Martin, takes place in the Core window, an area of memory represented on the screen by an 8000-cell battlefield. The battle programs try to alter cells (memory locations) that are important to an opposing program. The last program to remain intact is the winner.

You use a special programming language called Redcode to create *Core War* battle pro-

grams. Another program, called MARS (Memory Array Redcode Simulator), runs the war by alternately executing one instruction from each battle program. The battle's progress is illustrated in the Core window.

Armchair core warriors can enter the fray with ready-made battle programs, which have names like Dwarf, Vampire, and Gemini-Cannon. More adventurous warriors program their own champions.

Wator, a water-covered, doughnut-shaped planet inhabited by fish and sharks, was the subject of the December 1984 "Computer Recreations." In the program *Wator,* also created for the Mac by Robert Martin, humans determine the initial numbers of the two major Wator species and several other ecological parameters. Once the parameters are set, the program can begin. The course of life and death is revealed in



three windows. A map of the fish and the sharks on Wator is shown in one window, and the current population of each species and the time elapsed since the start in another. The third window displays a graph of population sizes over time. Different initial parameters yield conditions of varying stability that are fascinating to watch and difficult to predict. As an ecological simulation, *Wator* ably demonstrates an old ecological adage: simple ecosystems are usually unstable.

"Computer Recreations" will surely continue to inspire unusual and thought-provoking public-domain programs like *Wator* and *Core War.* Watch for them.–*Robert C. Eckhardt*

Macworld *pays up to $100 for each item published here. Mail your contributions to* Macworld View, *555 De Haro St., San Francisco, CA 94107, or send them electronically via CompuServe 70370,702 or The Source BCW440. All published submissions become the property of* Macworld. □

Macworld Best-Seller Software

This month	Business	Last month	Months on chart
1	Microsoft Excel, *Microsoft*	1	2
2	Microsoft Word, *Microsoft*	3	10
3	MacDraw, *Apple Computer*	6	7
4	Microsoft Multiplan, *Microsoft*	4	10
5	Dollars and Sense, *Monogram*	7	10
6	MacTerminal, *Apple Computer*	15	7
7	Jazz, *Lotus Development*	2	6
8	Microsoft File, *Microsoft*	5	9
9	Microsoft Chart, *Microsoft*	13	10
10	Omnis 3, *Blyth Software*	–	1
11	Back to Basics, *Peachtree*	–	1
12	pfs:file, *Software Publishing*	9	9
13	Ensemble, *Hayden Software*	–	0
14	pfs:report, *Software Publishing*	12	5
15	Front Desk, *Layered*	–	0

Source: InfoCorp survey of over 200 retail stores

Software Watch

Editors' choice: other recent software of particular interest

Interlace, *Singular Software*
Database manager

EZ-Draft, *Bridgeport Machines*
Computer-aided design (CAD)

MacLightning, *SoftDesign*
Spelling checker

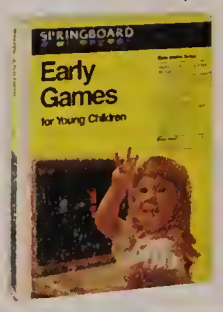
Children's Software from Springboard.™

The best way to introduce your child to the computer.

Early Games
for Young Children.™

This popular program offers a delightful collection of games designed to teach children ages 2½ to 6 a variety of important basic skills in a fun and friendly way.

Children learn to distinguish shapes, recognize letters, say the alphabet, count, add, subtract, even spell their names!



Large, colorful letters, gentle hints and a picture menu help children learn without adult supervision.

It's the perfect way to introduce your child to the computer.

Early Games *Easy as ABC*

Satisfaction Guaranteed
At Springboard, we stand behind our products.

That's why we offer a full 30-day money-back guarantee. Look for these and other Springboard products for all ages at your favorite software store.

Now Available For:
Macintosh
Apple II+, IIe, IIc, IBM PC, PCjr, Commodore 64/128

Easy as ABC.™

Learning the alphabet is a wonderful new adventure with Easy as ABC. Five fun games introduce children ages 3 to 6 to letter recognition, alphabetical sequence and upper/lower case letters.

Delightful animals present the alphabet in a variety of ways. Jumping frogs, buzzing bees and soaring rockets fascinate your children as they learn. And multiple skill levels keep them interested so they learn more.

No other program teaches your children the alphabet as thoroughly.

SPRINGBOARD™

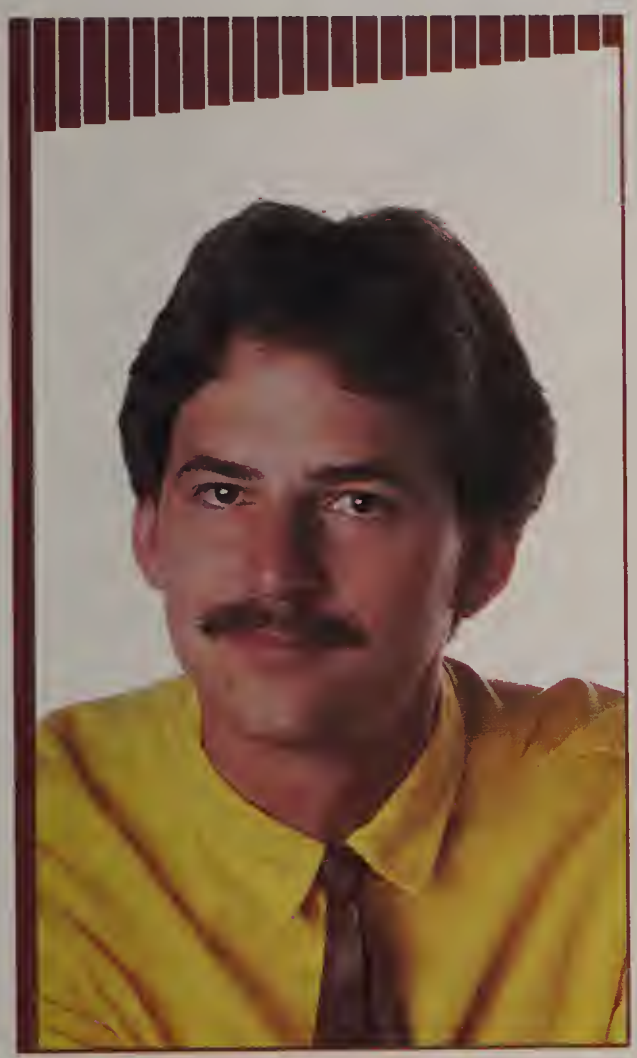
Springboard Software, Inc. • 7808 Creekridge Circle • Minneapolis, MN 55435 • (612) 944-3915

Circle 367 on reader service card

Get Info

Questions on XY plotting in Excel, word processing in columns, understanding file descriptors, and more

Lon Poole



Delete files with caution, or you may cause the application program to fail spectacularly.

If you want to create XY scatter graphs in Excel, *read about a technique that makes it possible. Also this month, information on pin-feed disk labels for neat printouts and desk accessories that let you delete files. A beep at startup and a flashing apple on the menu bar only mean that the Mac's alarm clock has gone off. There's no need to throw a pillow at it; just turn off the alarm. Some news about a word processing program that handles text in columns and an explanation of those cryptic descriptors, called* file flags, *that are assigned to every document.*

Excel Dates and XY Plots

Q. Can an *Excel* macro enter the current date and time? How can I make *XY* plots in *Excel?* The charts provide only one variable axis.

David W. Stokes
Gainesville, Florida

A. The NOW() function reports the current date and time, according to the Mac's clock, as a serial number. The following functions convert the serial number to one of its constituent parts:

DAY(serial-number)
HOUR(serial-number)
MINUTE(serial-number)
MONTH(serial-number)
WEEKDAY(serial-number)
YEAR(serial-number)

These functions, like all *Excel* functions, work in macro sheets as well as worksheets. For example, the macro formula =FORMULA("=DAY(NOW())") enters a formula into the currently selected cell to compute the current day of the month.

Regarding your second question, there are tricks to making an *XY* plot with *Excel:* enter the *X* values as labels (not values) on what *Excel* calls the category axis, enter the *Y* values on what *Excel* calls the value axis, and choose a scatter chart.

Begin by arranging your *X* and *Y* values into a table in a worksheet. The first column of values in the table enumerates the *X* values, and the second column contains the *Y* values. (You could arrange the values in rows instead of columns, in which case the *X* values go into the first row.) In *Excel* parlance, the *X* values are the categories, and the *Y* values make up a data series.

After setting up the table, select both columns (or rows) of the values, and choose Copy from the Edit menu. Next, open a new chart window and paste in the data from the worksheet, but do not use the Paste command, which treats the *X* values as a data series instead of categories.

Choose Paste Special on the Edit menu. In the dialog box that appears, select the option Categories in First Row. Click OK, and *Excel* plots the chart using its standard chart type, which is a column chart. In a column chart, each tick mark on the category axis corresponds to an *X* value from the worksheet.

Change the chart to a scatter chart by choosing Scatter on the Gallery menu. Select a chart style in the dialog box that appears. As *Excel* draws the scatter chart, it adjusts the *X* (category) axis so the tick marks measure equal increments in the *X* value, from the lowest to the highest value

(continues on page 74)

You've put your finger on 3 key reasons to subscribe...

1 SAVE OVER $23 A YEAR! Your subscription means handsome savings for you—almost 50% off the cover price.

2 GET THE MOST FROM YOUR MAC! Your money-saving subscription also insures a steady flow of the practical information you want—reviews of software and hardware you can rely on, new applications, techniques, and practical "how-to" tutorials.

3 GET THE MACWORLD GUARANTEE! We're so certain you'll get what you need—and more—from MACWORLD, we guarantee it! If for any reason you're not satisfied with MACWORLD, just let us know and we'll promptly refund the cost of your subscription for every unmailed issue.

MACWORLD
The Macintosh™ Magazine

Save

$23.40

off the

~~$47.40~~

cover price

Subscribe Now

YES! Please send me *Macworld,* the Macintosh Magazine

☐ $24 for 1 year (12 monthly issues)

SAVE EVEN MORE!

☐ $46 for 2 years (24 issues)

☐ Payment enclosed ☐ Bill me later

Name

Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in U.S. only. Offer expires December 31, 1986.

4A3A9

MACWORLD

Order Now to Take Advantage of This Limited Time Offer!

VISA and MasterCard Accepted!

Call TOLL FREE: 800/972-3100

(in Nebraska 402/895-7284)

Subscribe Now

YES! Please send me *Macworld,* the Macintosh Magazine

☐ $24 for 1 year (12 monthly issues)

SAVE EVEN MORE!

☐ $46 for 2 years (24 issues)

☐ Payment enclosed ☐ Bill me later

Name

Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in U.S. only. Offer expires December 31, 1986.

4A3A9

MACWORLD

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

NOW AVAILABLE
AN INTERNAL 20M HARD DISK AND MEMORY EXPANSION

Memory Expansion	from 512K	from 128K
512K	N/A	$239
1 MEG	$399	$599
1.5 MEG	$449	$649
2 MEG	$599	$799

Includes RAM Disk

Internal Hard Disk
20 MEG Internal
Hard Disk $1595

With our memory upgrades you will be able to run a RAM disk program to make your Macintosh "lightning fast." You will also be able to quickly and powerfully create and manipulate large files with programs such as PageMaker, Excel, MacDraft, etc. . .

With our 20 Megabyte Hard Disk you will be able to store the information which would occupy 50 400K diskettes. This means you will be able to organize all of your software in one place and manage large data bases such as a customer list. Our hard disk will also do far more for you because we include the following software: A Print Spooler which allows you to continue using your Macintosh while the printer is printing; Password protection so your information can be secure; Back-up and more.

Mass Tech
The Quality Computer Products Company

773 Boston Road,
Groton, MA 01450
617-448-3450

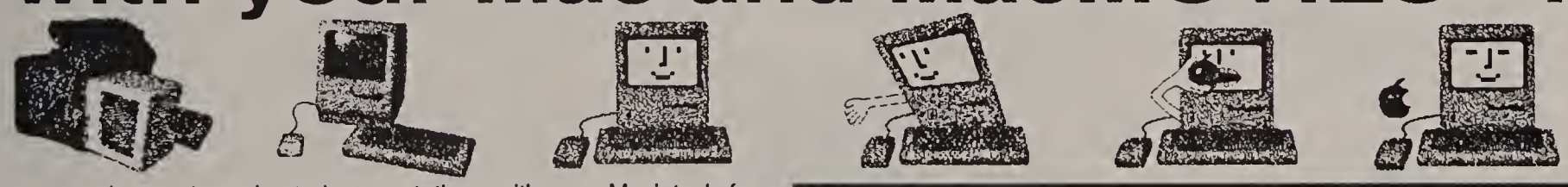
Dealer Inquires Invited

Call MassTech today at 617-448-3450 for the name of your nearest MassTech Dealer or service center.

Macintosh is a trademark of Apple Computer, Inc.; PageMaker is a trademark of Aldous, Inc.; Excel is a trademark of Microsoft, Inc.; MacDraft is a trademark of idd, Inc.

Circle 261 on reader service card

MAKE DIGITAL MOVIES with your Mac and MacMOVIES™!



If you need to make animated presentations with your Macintosh for business, education, entertainment, or just for fun, take a look at MacMOVIES™ from Beck-Tech!

FULL SCREEN ANIMATION at speeds up to 30 SCREENS PER SECOND!

MacMOVIES™ is a powerful set of animation tools - an "image processor" that goes beyond just slide show type programs. It allows you to compact many frames of animation down to a minimum amount of memory - and play the frames back smoothly, seamlessly, at speeds from single frame to 30 per second.

We listened to animators and artists who wanted a simple approach to computerizing the classic cel animation process, also known as "page flipping". We made MacMOVIES™ very easy to use, yet with powerful capabilities for professional animators.

MacMOVIES™ is incredibly FAST! The full screen image can be updated with no flicker at speeds up to 30 frames per second. (512K Macintosh required, 1024K or more recommended.)

Advanced animation programs from Beck-Tech - your Macintosh Enhancement Product Company

Circle 486 on reader service card

CAPABILITIES

Full screen updates at up to 30 frames per second
Compiles large movie files into small memory
Uses MacPaint™ format for maximum compatibility
PXRX Movie Interpreter program for development & editing
FMCOMP Movie Compiler program for 4:1 data compression
PROJECTOR program for single movie playback
MacMOVIES™ program for multiple movie sequences and longer playback
Speed and single frame interactive
More MacMOVIES™ tools to come in 1986
Runs under HFS as well as older systems
Mac and MacPlus Compatible

$99 - IMMEDIATE DELIVERY

Call toll-free to order (VISA and Mastercard accepted) or ask your local dealer.

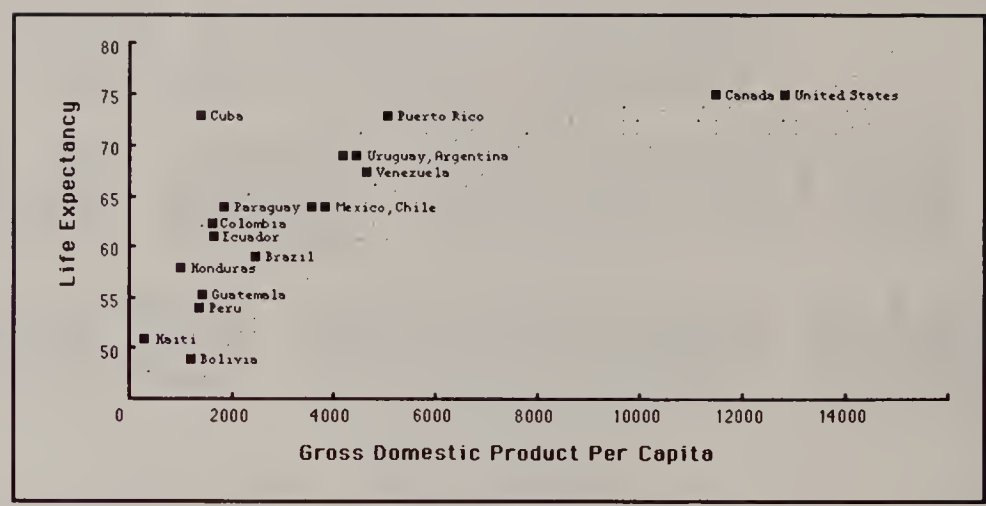
1-800-227-2400 ext. 999

See the amazing results possible with MacMOVIES™ by ordering a movie demo disk for just $9.95. Ask for the HEART or MOTOR demo.

For more information contact:
Beck-Tech 41 Tunnel Road Berkeley, CA 94705

(continued from page 71)

on the worksheet's row of *X* values, and plots the data points accordingly (see "Excel XY Plot"). Label the axes and the data points by choosing Attach Text on the Chart menu.



Excel XY Plot
Scatter plots are suitable for data based on two independent variables, such as life expectancy and GNP. This chart was created in Excel *and enhanced in* MacPaint.

Delete from Desk Accessory

Q. Is there a desk accessory that allows me to delete a file?

Robert Umlas
Palisades, New York

A. I know of two desk accessories that delete files. The *Extras* desk accessory displays a scrollable list of file names in a standard file selection dialog box. The *DiskInfo* desk accessory displays a scrollable list of file names in alphabetical or chronological order.

In either desk accessory, you select one file at a time for deletion. Both desk accessories ask you to verify your selection in a separate dialog box, and they ask for verification again if the file is locked. You can turn off all verification in *Extras* if, as program author Bob Luce puts it, "you never make mistakes."

Both desk accessories work with the original Macintosh File System used on single-sided disks. The versions available in early January (*Extras* 1.5 and *DiskInfo* 1.2) did not work with the new Hierarchical File System (HFS) used on Apple's hard disk and double-sided disks. Upgrades that will work with HFS are promised.

Delete files with caution, or you may cause the application program hosting the desk accessory to fail spectacularly. Don't delete any open files or any temporary files with names like Paint1, MW0001, Print File, and Undo File. Be especially careful when using the *Switcher* that you don't delete a file from one partition that's in use in another.

Both *Extras* and *DiskInfo* are distributed as shareware, so you can get copies from most user groups. You can order *Extras* for $10 directly from Bob Luce, 324 E. Shaw, Fresno, CA 93710. *DiskInfo* is available for $10 from Maitreya Design, P.O. Box 1480, Goleta, CA 93116, 805/968-7578.

(continues on page 78)

TRY NEW EZ-DRAFT™ SOFTWARE AND DRAW YOUR OWN CONCLUSION.

PC-based mainframe power in a CAD system. ONLY $2495.*

EZ-DRAFT is a full-featured, professional CAD/Drafting system for the Apple Macintosh™. It's ideal for every kind of drawing. Now both casual users and experts can...

- Select from a wide variety of forms, like boxes, hexheads, slots and B-splines.
- Make projections from a designated workview to any other orthogonal or isometric view.
- Down-load drawings from most mainframe CAD systems using IGES, including geometry, text, dimensions and views.
- Dynamically reposition dimension sets.
- Create high-quality technical documentation by using EZ-DRAFT drawings with Macintosh desktop publishing software.
- Use in EZ-DRAFT text and pictures that have been created with MacWrite™ and MacDraw™.
- Use plotters like HP and Calcomp and plot high-quality drawings on the Apple LaserWriter™.

EZ-DRAFT's the surefire way to increase efficiency and boost profits! Call today for complete details.

Applications support readily available.
Bridgeport Machines
Bridgeport, CT
1-800-242-2404

CAD SALES & SERVICE by Bridgeport®

*Price for software only. Requires minimum 512Kb ram and one external drive.

Apple is a trademark of Apple Computer, Inc. Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 479 on reader service card

tcp MAC CLASSIFIEDS

ORDERS ONLY
CALL TOLL FREE 1-800-468-9044
INFORMATION AND PA ORDERS 814-234-2236

OPEN 9-8 Mon-Fri; 10-5 Sat EAST COAST TIME

Software orders over $50.00 will be shipped FEDERAL EXPRESS (yes, even with *these* prices)

You only pay TCP's standard shipping charge of $4.00 per order. This offer also valid on peripherals and accessories under 8 pounds. Orders arriving before 11:00 AM our time will be shipped out same day.*

FEDERAL EXPRESS®

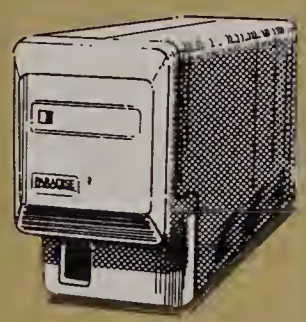
MICROSOFT®

The High Performance Software™

Excel	$219.00	Fortran	$call
Multiplan	$105.00	Business Pack	$call
File	$109.00	Chart	$72.00
Word	$109.00	Logo	$call
Basic	$87.00		

PARADISE

S Y S T E M S , I N C



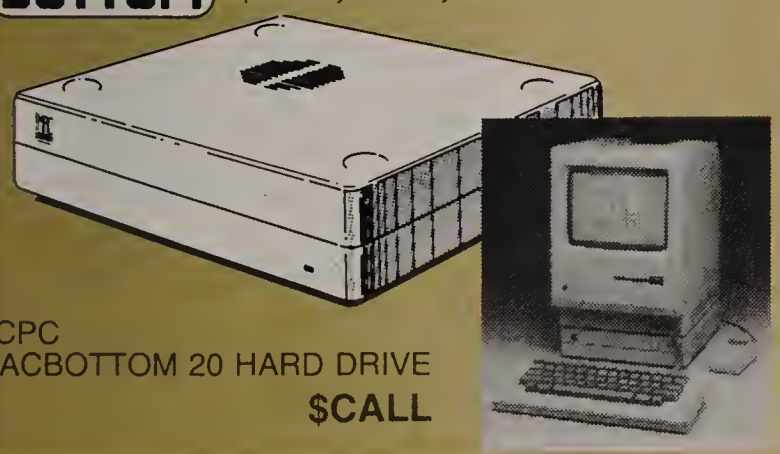
The Paradise Mac 10 provides 10Mb of fixed disk storage in a compact enclosure engineered to compliment the Apple® Macintosh computer.

PARADISE hard drives
MAC 10 ..... $CALL
MAC 20 ..... $CALL

MAC BOTTOM

Don't let the size of the MacBottom™ hard disk drive fool you.

This high capacity, 21 megabyte disk drive weighs just five pounds and fits perfectly under your Macintosh.



PCPC
MACBOTTOM 20 HARD DRIVE
$CALL

- If through some oversight we don't have the lowest price, we would appreciate the opportunity to beat it. If we can,you will still get the benefit of our Federal Express shipping on software orders over $100.00
- We accept MasterCard, Visa, COD and mail orders.
- Purchase orders accepted from qualified corporations and institutions. Minimum order of $500.00 required.
- No sales tax on orders outside PA
- Buy with confidence. We honor manufacturer's warranty.

VISA MasterCard

Circle 483 on reader service card

SOFTWARE

BUSINESS & PRODUCTIVITY

Affinity
Tempo $64.00

Apropos
Multiplan and Excel Templates
Financial Planning $49.00
Investment Planning $49.00

Arrays
Home Acct. $51.00

Assimilation
Work-n-Print $22.00
MacTracks $22.00
MacMemory Disk $22.00
M.I.D.I. Composer $22.00
MacSpell Right $67.00
Business Essentials $62.00
The Right Word $67.00

Blyth software
Omnis 3 ..... $call

Borland
Sidekick $42.00
Sidekick w/phonelink ..... $call

Creighton
MacSpell + ... $57.00

Cricket Graph
..... $129.95

Desktop Software
1rst Base, Merge, Port ..... $call

Digital, Etc.
Maccountant 2.0 ..... $99.00
Turbo Maccountant (incl. free video tape) ..... $call

Dubl-click
Calculator construction set $59.00

Expertelligence
Exper Logo $77.00
Experlisp ..... $call
ExperOPS5 ..... $169.00

Forethought
Filemaker $105.00
Factfinder $82.00

Hayden
Ensemble $155.00
DaVinci Buildings $29.00
DaVinci Interiors $29.00
DaVinci Landscapes $29.00
DaVinci Commercial Int. ..... $call
DaVinci Building BLocks ..... $call
Art Grabber w/Body shop $29.00
Speller $45.00

Kensington
Fonts $29.00
Fonts for Headlines $40.00

Layered
Front Desk ..... $call

Living Videotext
Thinktank 128,512 ..... $call

Manhatten Graphics
Ready Set Go $67.00

Megahaus
Call for our low price on all Megahaus products!!!

Microsoft
Excel $219.00
Multiplan $105.00
File $109.00
Word $109.00
Basic $87.00
Fortran ..... $call
Business Pack ..... $call
Chart $72.00
Logo ..... $call

Miles Software
Mac The Knife — 1 ..... $23.00
Mac The Knife — 2 ..... $28.00

Monogram
Dollars & Sense $80.00
Forecast $40.00

Odesta
Helix $216.00

Paladin
Crunch 512 ..... $149.00
Supercrunch ..... $call

Palantir
Mactype $26.00
Mathflash $26.00
A/R, GL, Inventory account. modules .. $call

Peachtree
GL/AP/AR ..... $call

Sartori
Bulk Mailing $77.00
Billing ..... $call

Sierra Information Systems
Accountant's ..... $call

Sierra-on-line
Mac OneWrite acct. modules $133.00

Silicon Beach Software
Silicon Press ..... $call
Accessory Pak I $23.00

Softstyle
DecisionMap $79.00

Softsync
Personal Acct. $52.00

Software Publishing
PFS File & Report $97.00

Telos
Filevision $104.00

T/Maker
ClickOn Worksheet $45.00
Click Art-Effects $27.95
Click Art-Publications $27.95
Click Art-Letters $27.95
Click Art-Pers. Graphics $27.95

GAMES AND EDUCATIONAL

HAYDEN
SAT $55.00
Sargon III $29.95

Infocom
Zork II or III $26.00
Zork I, Seastalker, Enchanter, Hitchikers guide, Planetfall, Wishbringer, The Witness, Cutthroats $23.00

Microsoft
Entrepreneur $31.00

Miles Software
Harrier Strike Mission $29.00
Macatack $29.00
Overloards ..... $call
Fusillade ..... $call
Macwars ..... $call

Mindscape
SAT $45.00
Deja Vu $29.00
Racter $26.00
Balance of Power $30.00
Rambo $24.00
The Mist $24.00
View to a kill $24.00

PBI
Feathers & Space $21
Strategic Conquest $29
Fokker $35

Silicon Beach
Airborne $19.95

Spectrum Holobyte
GATO $28.00

HARDWARE

Assimilation
Mac Daisywheel Connection $75.00
Mac Epson Connection $72.00
Mac Port Adapter $65.00
Mac Turbo Touch $77.00
Numeric Turbo $124.00

EPSON
All models in stock
CALL FOR LOWEST PRICES!!!

IOMEGA
All models in stock
CALL FOR LOWEST PRICES!!!

MICROSOFT
MacEnhancer ..... $call

PANASONIC
1091 ..... $222.00
1092 ..... $309.00
1592 ..... $CALL

PROMETHEUS
Promodem 1200 w/
Mac software ..... $call

STAR
Star to Mac Interface ..... $call
SG-10 ..... $call
SD-10 ..... $323.95
SG-15 ..... $364.00
SD-15, SR-10, SR-15 ..... $call

DISKS
SONY (10)SS/DD $19.95
MAXELL (10)SS/DD $18.95
FUJI (10)SS/DD $19.95
Call for price on DS/DD Disks

ACCESSORIES

Beck-Tech Fanny Mac $99.95

INNOVATIVE CONCEPTS
Flip-n-File Mocro (holds 25) $7.95
Flip-n-File (holds 40) $15.95

Innovative Technologies
Easel (holds 20 disks) $14.00
Disk Directory (holds 32) $19.95
Pocket Pack $9.95
Library $29.95

Compubag $54.00
Mousepad $5.95

Kensington
swivel $20.00
filter $29.00
control center $59.00
A-B box $59.00
surge suppressor $32.00
Maccessories starter pak $53.00
Mouse cleaning kit & pocket $16.00

*COD orders will be shipped UPS second day air. Orders under $100.00 will be shipped UPS ground. Call for shipping charges on hardware.

To Order by Mail: We accept money order, certified check, personal check. Allow 2 weeks for personal check to clear.

Shipping: $4.00 per order for software and accessories. Add $3.00 per box shipped COD. Call for shipping charges on Hardware. Additional shipping required on APO, FPO, AK, HI, and foreign orders.

Terms: **ALL PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA.** Manufacturer's warranty honored with copy of our invoice. Due to software piracy and our guarantee of factory fresh merchandise, **ALL SALES ARE FINAL.** Defective software replaced upon receipt. Defective hardware replaced or repaired at our discretion. Please call for an RA#. PA deliveries add 6% sales tax. Prices and terms subject to change without notice.

tcp TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

PROGRAMS PLUS ▷ 1-800-832-3201

Mac Specials!

Affinity Tempo	79.00
Blythe Software Omnis 3	239.00
Cauzin Systems	
Enter programs without typing a Single Line!	
Cauzin SoftStrip Reader	Call
Innovative Data Design	
MacDraft	139.00
Kalmar Designs	
Teakwood Roll-Top Disk Cases:	
Micro Cabinet *(holds 45 3½" disks)*	14.00
Double Micro Cabinet *(holds 60 3½" disks)*	21.00
Living Video Text	
Think Tank 512K	99.00
Lotus Jazz	319.00
Mark Of The Unicorn	
Professional Composer	235.00
Microsoft Excel	224.00
ODS, Inc. Consultant *(Version 1.6)*	109.00
Sales Consultant *(Version 2.0)*	179.00
Practical Computer Peripherals	
Mac Bottom Hard Disk 20MB	1149.00
ProVUE Development	
OverVUE 2.0	149.00
Singular Software	
Interlace	99.00
Telos	
Business FileVision	195.00
The Atlantis Company	
Microstore MS-1 *(Holds 80 3½" Disks!)*	12.00

Backup & Utility Software

Apple Computer	
Switcher Construction Set	12.00
Assimilation Process	
Work 'N' Print or MIDI Composer	22.00
Mac Memory Disk or Mac Mouse Tracks	22.00
Guardian	25.00
B/T Computing	
HeapShow *(Version 3.0)*	49.00
Central Point Software	
Copy II Mac	19.00
Computer: applications, Inc.	
][in a Mac *(Apple][Emulator)*	52.00
Crystal Canyon Computing, Inc.	
The Mac Librarian	29.00
Dreams Of The Phoenix	
Quick & Dirty Utilities Vol. 1 or 2	27.00
Fortnum Software MacNest	31.00
FWB Software Hard Disk Util	59.00
Hayden MUD *(MacroMind Utility Disk)*	29.00
Hippopotamus Software Hippo-Lock	65.00
Ideaform Mac Labeler *(Version 2.0)*	27.00
Infosphere MacServe	179.00
Kent Marsh Limited, Inc.	
MacSafe	44.00
Kette Group Powercache	21.00
Mainstay	
MacBooster or Disk Ranger	32.00
N' Cryptor	26.00
PacPaint or MacSpool	26.00
Meacom Mac +][*(Version 3.0)*	105.00
MicroAnalyst MacZap *(Version 4.1)*	34.00
Nashoba Systems FileFinder	18.00
Nevins Microsystems TurboCharger	55.00
New Canaan MicroCode	
Mac Disk Catalog II (512K)	36.00
PBI Software	
Icon Switcher	14.00
Icon Library—*Fun & Games or Business*	14.00
Practical Computer Applications	
MacBackup V4.0	49.00
SMB Development MacMate!	35.00
SoftStyle Printworks	Call
Epstart V2.0	26.00
Laserstart	58.00
TI Start or ColorMate	49.00
Jetstart or Toshstart	26.00
Symmetry Picture Base	32.00
Tesseract Software MacCopy Version II	37.00
Williams & Macias	
myDiskLabeler	31.00

Desk Accessory Programs

Affinity Microsystems	
Tempo	79.00
Batteries Included	
Battery Pak *(Version 1.1)*	27.00
Borland SideKick with PhoneLink	52.00
Dubl-Click Software	
Calculator Construction Set	59.00
Dreams Of The Phoenix Twelve-C	27.00
Electronic Arts	
Custom Calculator Construction Set	34.00
EnterSet QuickSet *(Version 2.0)*	27.00
QuickPaint	27.00
QuickWord	32.00
Haba Systems Haba Window Dialer	29.00
Harvard Associates Desk Toppers	29.00
Mainstay Type Now	26.00
MegaHaus MegaDesk	67.00
Silicon Beach Software	
Accessory Pak #1	21.00
Target Software MacLightning	59.00
T/Maker ClickOn Worksheet	46.00
Videx MacCalendar	49.00

Languages

Apple Computer MacPascal	95.00
Macintosh 68000 Development System	145.00
Consulair	
Mac C/Mac C Toolkit *(Version 4.0)*	269.00
Creative Solutions	
MacForth Level I—Explorer's System	78.00
MacForth Level II—Professional System	127.00
ExperTelligence ExperLogo *(Version 1.1)*	79.00
ExperLisp *(Version 1.04)*	239.00
ExperOPS5	169.00
Hippopotamus Software	
Hippo-C Level 1	75.00
Hippo-C Level 2	215.00
Hippo-C Upgrade Kit	135.00
Kriya Systems Neon!	129.00
Mainstay MacASM	75.00
Megamax, Inc. Megamax C Compiler	175.00
Microsoft Microsoft Basic *(Version 2.1)*	86.00
Microsoft Logo	75.00
Microsoft Fortran Compiler	169.00
Modula Corporation MacModula-2	90.00
Portable Software PortaAPL V3.0a	199.00
Signature Software McAssembly	69.00
SofTech Microsystems	
Mac Advantage UCSD Pascal	159.00
Softworks Ltd. Softworks C Compiler	129.00
Softworks Basic/Personal	69.00
Softworks Basic/Business	169.00
Terrapin MacLogo	55.00
Zedcor, Inc. ZBasic	69.00

Communications Software

Aegis Software MacMail-Telecom	29.00
Apple Computer MacTerminal	95.00
Compuserve Compuserve Starter Kit	21.00
DataViz MacLink with Cable	109.00
Desktop Software 1st Port	48.00
Dilithium Press	
PC to Mac and Back with Cables	89.00
Dreams Of The Phoenix	
Mouse Exchange Terminal or BBS	27.00
Haba Systems HabaCom	42.00
Hayes Microcomputer Smartcom II	86.00
Kaz Business Systems MacDasher-Data Gen. D210 Term. Emulator	45.00
Mainstay Telescape	78.00
Turbo Download	25.00
Mesa Graphics Tekalike	149.00
Mycroft Labs Mite	87.00
Palantir inTouch	79.00
Prometheus ProCom-M	69.00
Smith Micro Software Market Link	42.00
Source Telecomputing	
The Source *(subscription & manual)*	30.00
Videx Mail Center *(2 User)*	169.00
Mail Center *(6 Users)*	269.00

Business Software

Aegis Software The HouseKeeper	32.00
Apple Computer MacProject	145.00
Assimilation Process	
Mac Spell Right or The Right Word	69.00
Business Essentials	65.00
The Thesaurus	25.00
Creighton Development	
MacHome or MacOffice	26.00
MacSpell +	55.00
Cricket Software Cricket Graph	135.00
DataPak Software My Office	95.00
Executive Office	225.00
Liberty Spell-Checker	42.00
Dreams Of The Phoenix	
Day Keeper Calendar	27.00
Desktop Software First Base	95.00
First Merge	48.00
Electronic Arts Financial Cookbook	32.00
Emerging Technology MacOffix	79.00
Eqtron MacBase	75.00
Forethought Factfinder	84.00
Filemaker	105.00
Gamma Productions	
Tax Wizard 85/86	45.00
Greene, Johnson, Inc. Spellswell	36.00
Haba Systems HabaWord or MacRelax	59.00
Haba Wills, Forms, or Business Letters	31.00
Hayden Software Ensemble	59.00
Hayden: Speller	45.00
I Know It's Here Somewhere	35.00
Human Edge Software	
The Communications Edge	27.00
The Management Edge or Sales Edge	27.00
The Mind Prober	26.00
The Negotiation Edge	27.00
Layered Front Desk	77.00
Notes For Jazz or Excel	42.00
Lazer Software LazerBase	59.00
Living Videotext Think Tank 128	52.00
Think Tank 512	99.00
Mainstay Micetro Information Manager	69.00
MegaHaus *Mega Business Pack:*	
Filer, Form, Merge & Desk	235.00
MegaFiler	99.00
MegaForm	149.00
MegaMerge	65.00
Micro Planning Software	
Micro Planner	239.00
Microsoft	
Microsoft File, Multiplan, or Word	110.00
Microsoft Chart	72.00
Microsoft Excel	224.00
Nolo Legal Software WillWriter	25.00
Odesta Helix *(Version 2.0)*	219.00
Paladin Crunch	165.00
Satori Software Bulk Mailer	79.00
Smith Micro Software	
Stock Portfolio System	109.00
Softstyle Decision Map	76.00
SofTech Microsystems MailManager	69.00
SoftView	
MacInTax Federal *(1985 Tax Season)*	52.00
MacInTax Business Supplement	23.00
MacInTax California State Supplement	23.00
Software Publishing	
PFS:File & Report	99.00
StatSoft DataFast	39.00

Publishing Tools

Aldus PageMaker	369.00
Boston Software Publishers	
The MacPublisher	72.00
The MacPublisher II	109.00
Manhattan Graphics	
ReadySetGo! *(Version 2.1)*	99.00
Microsoft Typographer	112.00

Overlays For Multiplan™

Apropos	
Tax Planner '85-'86	29.00
Financial Planning or Investment Planning	45.00
Harris Technical Systems	
Profit Projections/Breakeven Analysis	47.00
RealData, Inc.	
Overlays For Multiplan, Jazz & Excel™	
Tax Shelter Syndication Analysis	169.00
On Schedule	119.00
Real Estate Investment Analysis	89.00
Financial Analysis	59.00
Commercial/Industrial Applications	59.00
Residential Real Estate	59.00
Overlays For Microsoft Excel™	
Property Management Level I	175.00
Mortgage Qualifier	119.00

Accounting Packages

Aegis Software ZAPI Invoice	54.00
Applied Logic Systems	
BizMac Small Business Systems	Call
Chang Labs	
Rags to Riches GL, AR, or AP	99.00
Rags to Riches Three Pack—GL/AR/AP	245.00
Check-Mark Software	
AMS General Ledger	75.00
Check-Mark Payroll	75.00
Continental/Arrays	
The Home Accountant	75.00
Digital, Etc. *Turbo* Maccountant	239.00
Maccountant	139.00
Future Design Software	
Strictly Business Accounting System: Module 1—General Ledger	199.00
Haba Systems Haba Checkminder	42.00
Micromax *Gallery Finance Package:*	
GL/AR/AP/Cash Disbursements	259.00
Gallery Finance Package: Special Edition	179.00
Monogram Dollars & Sense	81.00
Forecast	40.00
Open Systems Open For Business I	295.00
Open For Business II	495.00
Orion Training Systems	
Orion Checkwriter	52.00
Palantir General Ledger	69.00
Accounts Receivable	69.00
Inventory Control	69.00
Peachtree General Ledger	87.00
Accounts Receivable	87.00
Accounts Payable	87.00
Sierra Information Systems	
Accountant's Choice General Ledger	Call
Accountant's Choice Payables	Call
System Manager	Call
Sierra On-Line	
MacOneWrite GL, AR, or Payroll	137.00
MacOneWrite/Cash Disbursements	137.00
Simon & Schuster	
J.K. Lasser's Money Manager	59.00
J.K. Lasser's Income Tax	49.00
SoftSync Personal Accountant	54.00
Symposium	
Symposium General Ledger	175.00
Timeworks	
Sylvia Porter's Financial Planner	51.00

Statistics Packages

BrainPower Statview	99.00
StatView 512 Plus	179.00
Cricket Software Statworks	79.00
Northwest Analytical NWA StatPak	229.00
NWA Quality Analyst	299.00
StatSoft StatFast-2	75.00

Graphics Software

Apple Computer MacDraw	145.00
Altsys Corp. Fontastic	24.00
Ann Arbor Softworks	
Animation Tool Kit I	31.00
InMotion	99.00
Casady Company Fluent Fonts	29.00
Challenger Software Mac 3D	125.00
Enabling Technologies Easy 3D	59.00
Esoft Enterprises ColorChart	32.00
Hayden Art Grabber	29.00
VideoWorks	57.00
Home Design w/Art Grabber	48.00
DaVinci: Buildings	29.00
DaVinci: Building Blocks	46.00
DaVinci: Commercial Interiors	114.00
DaVinci: Interiors or Landscapes	29.00
Innovative Data Design MacDraft	139.00
Paste-Ease *(Volume I & II)*	35.00
I/O Designs ColorPrint Software Only	25.00
ColorPrint Starter Kit-3	39.00
T-Shirt Factory	25.00
ColorRibbon—Heat Transfer Ribbons (ea.)	9.00
Kensington Microware Graphic Accents	29.00
Professional Type Fonts For Text	29.00
Professional Type Fonts For Headlines	42.00
Magnum Software McPicl Volume 1 or 2	28.00
The Slide Show Magician	34.00
Mesa Graphics Plot-It	59.00
Microsoft Microsoft Art Manager	38.00
MicroSpot MacPalette	52.00
MacPlot	117.00
MacPlot Professional	224.00
Miles Computing	
Mac The Knife Volume III	27.00
Mac The Knife Volume IV	27.00
Polarware	
The Graphics Magician Painter & Animator	52.00
Silicon Beach Software	
Silicon Press	48.00
Springboard	
Art A La Mac Vol. 1—People & Places	23.00
Art A La Mac Vol. 2—Variety Pack	23.00
T/Maker	
Click Art Letters or Personal Graphics	29.00
Click Art Publications or Effects	29.00
Vamp, Inc. McCad	299.00

Educational/Creative Software

Addison Wesley Smart Eyes	36.00
ATI MacCoach Training	45.00
Teach Yourself Multiplan	45.00
Teach Yourself Excel	45.00
BrainPower Chipwits	26.00
PowerMath	52.00
Thinkfast	22.00
Camde Nutri-Calc	49.00
Davidson & Asso. Speed Reader II	37.00
Spell It!, Math Blaster, or Word Attack	27.00
Electronic Arts Pinball Construction Set	27.00
Deluxe Music Construction Set	32.00
First Byte Smooth Talker *(Version 2.0)*	55.00
Kid Talk or Speller Bee	42.00
Forethought Typing Intrigue	29.00
Fortnum Software MacChemistry	89.00
Two Disk Set Includes Templates & Chemlab	
Great Wave Software ConcertWare Plus	39.00
ConcertWare Music V.1, V.2, or V.3	12.00
Comet Halley	19.00
KidsTime	31.00
Harvard Associates MacManager	29.00
Hayden MusicWorks	45.00
Score Improvement System for the SAT	57.00
Score Improvement—Achievement Tests	57.00
Turbo Turtle	35.00
Computer Novel Construction Set	29.00
Hippopotamus Software	
Hippo Computer Almanac	20.00
Hippo Jokes & Quotes	20.00
Hippo Sound Studio I	29.00
Micro: Maps MacAtlas Volume 1 or 2	49.00
Microsoft Entrepreneur	29.00
Learning Multiplan & Chart	37.00
Mindscape Perfect Score SAT	47.00
The Lucher Profile	24.00
Ortho Information Services	
ORTHO Computerized Gardening	29.00
Palantir	
MacType, MathFlash or WordPlay	26.00
QED Typing Made Easy	36.00
Queue Intellectual Software	
Not Like The Others	36.00
How Many? or Early Reader	25.00
What Comes Next?	35.00
Reading & Thinking I or II	39.00
Vocabulary Adventure I or II	44.00
Spanish Grammer I, II or III	25.00
World Geography Adventure I or II	44.00
U.S. Geography Adventure	44.00
How A Bill Becomes A Law	44.00
American History Adventure	44.00
Starting A New Business	44.00
Analogies I or II	49.00
College Aptitude Reading Exercises	49.00
Rubicon Publishing	
Dinner at Eight or SongPainter	32.00
Deja Vu	22.00
Scarborough Make Millions	29.00
MasterType	25.00
Run For The Money	15.00
Shaherazam	
Music Type 2.0 or Mac-A-Mug	39.00
Simon & Schuster Mac Art Dept.	24.00
Typing Tutor III	35.00
Paper Airplane Construction Set	24.00
Software Concepts	
Concepts Computerized Atlas	45.00
Spectrum Holobyte	
Tellstar Level 1 *Northern Hemisphere)*	27.00
Tellstar Level 2 *(Northern & Southern)*	42.00
Think Educational	
MacEdge II or Mind Over Mac	28.00
TimeWorks	
Evelyn Wood Dynamic Reader	41.00
Unicorn Software	
Animal Kingdom or MacRobots	27.00

Game Software

Activision Borrowed Time	27.00
Championship Star League Baseball	21.00
Hacker or Mindshadow	27.00
Aegis	
MacChallenger or Pyramid of Peril	23.00
Ann Arbor Softworks Grid Wars	22.00
Bantam Books	
Sherlock Holms: "Another Bow"	27.00
Blue Chip Software	
Barron or Millionaire, Squire, or Tycoon	30.00
Broderbund Ancient Art of War	27.00
Cyborg or Lode Runner	24.00
CBS Software Murder by the Dozen	25.00
Felony	27.00
Creighton Development Mac Command	18.00
EPYX Winter Games or Rogue	24.00
Temple of Apshai Trilogy	24.00
Electronic Arts	
ChessMaster 2000	29.00
Dr. J & Larry Bird go One-On-One	26.00

In Connecticut Call 378-3662 or 378-8293

SkyFox or Archon	26.00
Software Golden Oldies	24.00
Fortnum Software	
MacInooga Choo-Choo	21.00
Hayden Software Holy Grail	29.00
Masterpieces or Perplexx	24.00
Sargon III or Inca	29.00
Word Challenge II	24.00
Infocom A Mind Forever Voyaging	26.00
Cutthroats or Enchantor	23.00
Deadline or Starcross	29.00
Hitchhiker's Guide or Zork I	23.00
Infidel, Zork II or Zork III	26.00
Planetfall or Seastalker	23.00
Sorceror or Suspect	26.00
Suspended or Spellbreaker	29.00
Wishbringer or Witness	23.00
Invisiclues—Hint Booklets (ea.)	6.00
Magnum Software Gypsy	23.00
Miles Computing	
MacAttack or MacWars, or Overlords	27.00
Harrier Strike Mission, or Fusillade	27.00
DownHill Racer	27.00
Mindscape Balance of Power	30.00
Deja Vu: A Nightmare Comes True	33.00
James Bond 007: A View To Kill	24.00
Racter or The Halley Project	27.00
Rambo: First Blood Part II	24.00
Stephen King's: The Mist	24.00
Origin Systems Ultima III or Ultima IV	37.00
Other Valley Software	
Monkey Business or Delta Patrol	21.00
PBI Software Feathers & Space	21.00
Strategic Conquest	29.00
Fokker Triplane	35.00
Polerware Pensate or Transylvania	24.00
Xyphus, The Quest, or Crimson Crown	24.00
Practical Computer Applications	
MacGolf	35.00
Psion	
Psion Chess *(3D & Multi-Lingual)*	31.00
Pryority Software	
Forbidden Quest or Gateway	26.00
Sierra On-Line	
Championship Boxing or Frogger	24.00
Ultima II	35.00
Silicon Beach Software	
Airborne! or Enchanted Scepters	21.00
Sir Tech Wizardry	36.00
Spectrum Holobyte GATO or Orbiter	26.00
Star Systems Software	
12 Classic Adventures	39.00
Strategic Simulations	
Gemstone Warrior	21.00
Synapse Software	
Mindwheel, Essex, or Brimstone	27.00
Telerium Amazon or Dragon World	27.00
Farenheit 451 or Rendezvous w/Rama	27.00
Unicorn Software Futuria or Utopia	24.00
Videx Fun Pack	23.00
MacCheckers & Reversi	28.00
MacGammon & Cribbage	28.00
MacVegas	34.00

Disk Drives/Hard Disks

Apple Computer	
Macintosh Hard Disk 20	1189.00
Macintosh External 800KB Drive	389.00
Assimilation Process	
Excalibur 2 Meg External Ram Drive	Call
AST Research AST-4000	Call
74 MB External Hard Disk with 60-MB Cartridge-Tape Backup for the Macintosh Plus	
Corvus	
Omnitalk Starter systems include Drive, Interface, Cable, & OmniTalk Multiuser Software	
11 MB Mac OmniTalk Starter System	1679.00
21 MB Mac OmniTalk Starter System	2349.00
45 MB Mac OmniTalk Starter System	3869.00
126 MB Mac OmniTalk Starter System	6719.00
OmniTalk Multiuser Software	279.00
DataSpace	
Mac 800K External Drive	299.00
Hebe Systems	
HabaDisk 800 KB DS/DD External Drive	249.00
Iomega	
Bernoulli Box Personal Server 5MB	1299.00
Bernoulli Box for MacPlus 5MB	1279.00
Bernoulli Box for AppleTalk 2-10MB	2619.00
Bernoulli Box for MacPlus 2-10MB	2449.00
5 Meg Cartridge	39.00
Head Cleaning Kit	59.00
LoDOWN	
Hard Disk & Tape Backups for the MacPlus	
LoDown-T20 20 Megabyte Tape Drive	779.00
LoDown-T60 60 Megabyte Tape Drive	1579.00
LoDown-10 10 Megabyte Hard Disk	709.00
LoDown-20 20 Megabyte Hard Disk	879.00
LoDown-40 40 Megabyte Hard Disk	1649.00
LoDown-80 80 Megabyte Hard Disk	3299.00
Maple Technology	
MT-3002 800K External Drive	199.00
MDidess, Inc.	
HD-20 *(20MB Hard Disk For MacPlus)*	829.00
HD-30 (30MB Hard Disk For MacPlus)	1199.00
Microtech	
Auto-Eject Drive with 1 Year Warrantee	
MAC535-20 800KB External Drive	259.00
Mirror Technologies	
Magnum 800K External Drive	275.00
MagNet 20X External 20MB Hard Drive	Call
Magnum Tape 10MB or 20MB Tape Backup	Call
Mitsuba	
Super 5 Mac 400K External Drive	215.00
Super 5 Mac 800K External Drive	329.00
Paradise Systems	
Mac 10 Hard Disk Subsystem	649.00
Mac 20 Hard Disk Subsystem	849.00
Personal Computer Peripherals	
MacBottom Hard Disk 20MB	1149.00
Quark QC10-10 Meg Hard Disk	819.00
QC20-20 Meg Hard Disk	1139.00
SuperMac	
DataFrame 20MB Hard Disk / MacPlus	899.00
Western Automation Labs	
Dasch External RAMdisk 500KB	395.00
Dasch External RAMdisk 1000KB	595.00
Dasch External RAMdisk 2000KB	725.00

Modems

Anchor Automation	
Signalman Express 1200 Baud	229.00
Signalman Lightning 2400 Baud	349.00
Apple Computer	
Apple Personal Modem 300/1200	279.00
Hayes Microcomputing	
Smartmodem 300	135.00
Smartmodem 1200	359.00
Smartmodem 1200 Mac w/Smartcom II	429.00
Smartmodem 2400	575.00
Transet 1000 128K	259.00
Transet 1000 Mac Accessory Kit	31.00
Kensington	
Portable Modem (300 Baud)	86.00
Microcom	
Mac Modem 1200 *(Hayes Compatible)*	399.00
Novation	
Cat Comm Communications System	299.00
Prentics	
Popcom X-100 Modem w/Straightalk	259.00
Promethus	
Promodem 1200M w/ProCom-M	289.00
U.S. Robotics Password 1200	199.00
Courier 2400	389.00

Printers

Apple Computer	
ImageWriter II Color Printer	459.00
ImageWriter II 32K Buffer	79.00
ImageWriter II Cut Sheet Feeder	165.00
ImageWriter Wide Carriage	479.00
LazerWriter	4569.00
Brother HR-15XL	319.00
HR-25	450.00
HR-35	670.00
TwinWriter 5 Dual Head Printer	839.00
Epson AP-80 Imagewriter Compatible	Call
DX-10/20 DaisyWheel	Call
FX-85/185 w/Serial Interface	Call
LQ-800/1000/1500 w/Serial Interface	Call
SQ-2000 w/Serial Interface	Call
Hewlett Packard	
Thinkjet, LazerJet, LazerJet Plus	Call
Juki 6100 Serial	379.00
6200 Serial	559.00
6300 Serial	659.00
NEC SpinWriter e.l.f. 360	379.00
SpinWriter 2010	625.00
SpinWriter 3510	995.00
SpinWriter 8810	1279.00
Color PinWriter CP2-6 10"	699.00
Color PinWriter CP3-6 15"	949.00
Colormate	49.00
NEC SpinWriter Accessory Kit	79.00
Okidata ML-192 Apple Mac/Lisa	369.00
ML-193 Apple Mac/Lisa	545.00
Toshiba P-1340 Parallel/Serial	399.00
P-341 Parallel/Serial	789.00
P-351 Parallel/Serial	1049.00

Blank Media

Single Sided 3½" Media	
BASF 3½" SS/DD Disks *(box of 5)*	12.00
Bulk 3½" SS/DD Disks *(box of 10)*	18.00
Sony 3½" SS/DD Disks *(box of 10)*	20.00
Fuji 3½" SS/DD Disks *(box of 10)*	21.00
Maxell 3½" SS/DD Disks *(box of 10)*	22.00
Memorex 3½" SS/DD Disks *(box of 10)*	23.00
Verbatim 3½" SS/DD Disks *(box of 10)*	22.00
3M 3½" SS/DD Disks *(box of 10)*	23.00
Double Sided 3½" Media	
BASF 3½" DS/DD Disks *(box of 5)*	15.00
Fuji 3½" DS/DD Disks *(box of 10)*	31.00
Maxell 3½" DS/DD Disks *(box of 10)*	31.00
Sony 3½" DS/DD Disks *(box of 10)*	31.00
Verbatim 3½" DS/DD Disks *(box of 10)*	31.00
3M 3½" DS/DD Disks *(box of 10)*	31.00

Digitizers

GTCO Corporation Macintizer	399.00
Kette Group	
Capture any sound from the real world!	
MacNifty Sound Digitizer	115.00
Koala Technologies Corp.	
KAT Graphics Tablet	135.00
MacVision	169.00
New Image Technology Magic Digitizer	249.00
Summagraphics Maclablet	329.00
ThunderWare Thunderscan	175.00

Accessories

A.M. Products	
3½" Head Cleaning Kit	18.00
Apple Computer Macintosh Carry Case	85.00
Assimilation Process Numeric Turbo	145.00
Mac Turbo Touch	79.00
Mac Port Adaptor	85.00
MIDI Conductor	75.00
Joystick Adaptor & Mac Man Game	25.00
Mac Epson Connection	40.00
Mac DaisyWheel Connection	45.00
Bech-Tech Fanny Mac	79.00
Creighton Development	
ProPrint Software Only	39.00
ProPrint with Cable	52.00
Curtis Manufacturing	
Diamond-Surge Suppressor-SP1	28.00
Emerald-Surge Suppressor-SP2	34.00
Ruby-Surge Suppressor-SPF-2	50.00
Sapphire-Surge Suppressor-SPF-1	44.00
Crystal Power Conditioner-SPF-5	115.00
Datashield	
Backup AC Power Supply (200 Watts)	249.00
DataSpace Max Print Buffer 256K	409.00
Diversions, Inc. Underware Ribbon	9.00
Underware Color Pens-Small	9.00
Underware Color Pens-Large	13.00
Environmental Software Company	
MacAttire: Available in Navy-Blue, Burgundy, or Silver-Gray.	
External Drive or Keypad Cover	7.00
Imagewriter Cover	11.00
ImageWriter II Cover	11.00
Wide ImageWriter Cover	13.00
Mac & KeyBoard Cover	15.00
Macintosh Plus Cover	16.00
LazerWriter Cover	17.00
Mac XL & Keyboard Cover	20.00
Ergotron MacTilt	75.00
MacBuffer 128K	179.00
MacBuffer 512K	259.00
MacBuffer 1 Meg	399.00
Hanzon Universal Data Buffer w/64K	289.00
Innovative Concepts	
Flip 'n' File/Micro	8.00
Flip 'n' File II/Micro	18.00
Innovative Technology	
The Pocket Pack *(holds 6 disks)*	9.00
The Easel *(holds 20 disks)*	12.00
The Pyramid	14.00
The Disk Directory	18.00
The Library	27.00
Compu-Bag	52.00
I/O Design Imagewriter Carrying Case	39.00
ImageWriter II Carrying Case	49.00
Imagewriter Wide Carrying Case	49.00
Macintosh Carrying Case	49.00
Kensington A/B Box	60.00
Disk Case *(holds 36 Mac disks)*	19.00
Disk Drive Cleaning Kit	19.00
External Disk Drive Cover	8.00
ImageWriter or ImageWriter II Cover	8.50
Macintosh Dust Cover	8.50
Mouse Cleaning Kit w/Pocket	16.00
Mouse Pocket	8.00
Mouse Way *(Mouse Pad)*	8.00
Circular Polarizing Filter	31.00
Starter Pack *(includes Tilt/Swivel)*	53.00
Surge Protector	32.00
Swivel	21.00
Tilt/Swivel	22.00
Control Center	60.00
Printer Stand	17.00
Kette Group MacNifty Joystick Converter	35.00
MacNifty Stereo Music System	55.00
MacNifty A/B Switch	22.00
MacNifty A/B/C/D Switch	32.00
Kraft QuickStick	45.00
Microsoft MacEnhancer V2.0	159.00
Mouse Systems A+ Optical Mouse	59.00
MousTrak MousePad 7" x 9" Size	8.00
MousePad 9" x 11" Size	9.00
MPH Computer Products MAC-B-COOL	99.00
N² Products Inc.	
Macintosh to Modem Cable *(6 feet)*	19.00
Macintosh to Printer Cable *(6 feet)*	19.00
Optimum Computer Luggage	
MacTote Mac Carry Case	60.00
Personics, Inc. View Control System	179.00
Ribbons Unlimited	
Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
ImageWriter Ribbon—Black	4.50
ImageWriter Ribbon—Color	5.00
ImageWriter Rainbow Pack (6 Colors)	27.00
Smith & Bellows	
Hand Crafted Mahogany Disk Case:	
Holds up to 90 Diskettes	28.00
Hand Crafted Basswood Disk Case:	
Holds up to 90 Diskettes *(Natural or Stain)*	19.00
Systems Control MacGuard	55.00
Tangent Technologies LTD	
PC MacKey *(IBM Style Keyboard)*	219.00
Video 7 Mouse Stick	38.00

Books

Microsoft Press	
Creative Programming in Microsoft Basic	14.00
Excel in Business	17.00
Inside MacPaint	14.00
Macintosh Midnight Madness	14.00
MacWork/MacPlay	14.00
Microsoft Macinations	16.00
Microsoft Multiplan: Of Mice & Menus	13.00
Presentation Graphics on The Apple Macintosh	14.00
The Apple Macintosh Book	14.00
The Printed Word	13.00

ORDERING INSTRUCTIONS:

VISA AND MASTERCARD ACCEPTED
To order, call us anytime Monday thru Friday 9:00 to 9:00, Saturday 10:00 to 6:00. For fast delivery if ordering by mail, send cashier's check, certified check or money order. Fortune 1000 & Government checks honored immediately. Personal and other company checks allow 2 weeks to clear. MasterCard & Visa include card # & expiration date. Connecticut residents add 7.5% sales tax.
Shipping Charges: Software—$3.00 Minimum charge U.S. Mainland. With C.O.D. shipments add an additional $2.00 U.S. Postal, APO, and FPO add 3% ($5.00 Min.). Alaska or Hawaii add 6% ($10.00 Min.). Canadian orders add 10% ($15.00 Min.). Foreign Orders except Canada—Add 18% ($25.00 Min.).
Hardware—Please call for shipping charges.
Our Policy: We do not guarantee machine compatibility. All products are new and include factory warranty, therefore ALL sales are final. Defective software will be replaced by the same item only. Defective hardware will be replaced or repaired at our discretion. Prices & availability subject to change without notice. Products purchased in error, subject to 20% restocking fee. All returns must have an authorization number. Call (203) 378-3662 to obtain one before returning defective products.

Visit Our New Showroom: Exit 32 off I-95

PROGRAMS PLUS

Visit Our New Showroom: Exit 32 Off I-95
Station House Square
2505 Main Street
Stratford, Conn. 06497
Telephone Hours: Monday-Friday 9-9;
Saturday 10-9
Showroom Hours: Monday-Friday 9-6;
Saturday 10-6

Orders Only TOLL-FREE **1-800-832-3201**
MACINTOSH 512K/MACPLUS SYSTEMS CALL
Circle 194 on reader service card

COPY II MAC™

BACKS UP PROTECTED SOFTWARE.

Copy II Mac does more than just sector copy. Its bit copy program has the built-in power and flexibility to handle most protection schemes automatically and supports single and double-sided drives. (We update Copy II Mac as often as needed to handle new protections; you as a registered owner may update at any time for $15 plus $3 s/h.)

RUNS PROTECTED SOFTWARE FROM YOUR HARD DISK.

Copy II Mac makes using your hard disk (including the Apple hard disk-20) as convenient as it should be. No longer will you have to use the 3½" disk with some of the most popular business software. Call for current list.

GIVE YOUR MAC MORE MUSCLE.

Copy II Mac can even repair some damaged disks and recover accidentally deleted files.

System Requirements: Macintosh or Macintosh Plus, 1 drive. (2 drives, all available memory and hard disks fully supported.)

Call 503/244-5782, M–F, 8–5:30 (West Coast time) with your MasterCard VISA in hand. Or send a check for $39.95 U.S. plus $3 s/h, $8 overseas.

$39.95

Central Point Software, Inc.
9700 S.W. Capitol Hwy. #100
Portland, OR 97219

Central Point Software INCORPORATED

Backup utilities also available for the IBM, Apple II and Commodore 64/128.

Circle 175 on reader service card

Williams & Macias

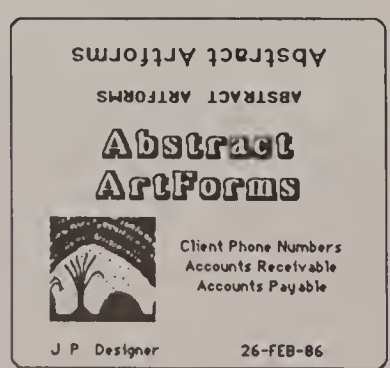
NEW

myDiskLabeler™

myDiskLabeler,™ the finest disk labeling product available, lets you design and print unique, high quality, removable labels for your 3½" disks.

New, Version 2 With Icon Grabber

The advanced, **Version 2 myDiskLabeler**™ lets you grab application icons and modify them. Create your own distinctive icons with the Icon Editor or with Macpaint.™ Seven windows provide editing of text and graphics: Disk Name, Edge Title, Back Title, Contents, Picture, Owner, and Date. **myDiskLabeler**™ also reads and sorts disk directories. Saves labels for easy updates. **myDiskLabeler**™ supports HFS, Apple's new Hierarchical Filing System.



Color Printing

Design and print color labels with our color option and Imagewriter II.™ Option is just $10.00 more.

Precision Printing

Print single or multiple labels. Graphics interface makes alignment of Smart Labels™ quick and easy.

Smart Labels™

myDiskLabeler™ comes with 54 die-cut Smart Labels™ designed specifically for the Imagewriter.™ Labels wrap around the disk edge, have a matte finish, and are removable. Refills are $5.00 for 54 labels, $9.50 for 108, or $18.00 for 216.

Call today, or ask your Apple dealer. Shipping to 48 states is $3.00 ($1.00 for each addt'l. item). **myDiskLabeler**™ is for Macintosh ™ (MacPlus, 128, 512, or XL) and Imagewriters.™

Version 2, Only $44.95*
With Color, Only $54.95*
Call Toll-free: 1-800-752-4400
M—F 8:00 a.m. to 5:00 p.m. PST
Washington & Alaska, call (509) 458-6312

*Washington State residents add 7.8% sales tax. Macintosh, Imagewriter, & Macpaint are trademarks of Apple Computer, Inc.

Williams & Macias Microcomputer Products
Spokane International Airport Business Park
P.O. Box 19206, Spokane, Washington 99219

Circle 374 on reader service card

Get Info

(continued from page 74)

Printing Disk Labels

Q. When I print a disk label, the blank label slips around in the Imagewriter. Taping the blank label to a piece of paper works but is cumbersome, slow, and unreliable. Do you know a better way?

Jeffrey Hallett
Locke, New York

A. Pin-feed labels should solve your problem. You can obtain them from New Canaan Microcode (136 Beech Rd., New Canaan, CT 06840, 203/966-6969) or from Ideaform Inc. (908 E. Briggs, Fairfield, IA 52556, 515/472-7256).

Alarm

Q. My Macintosh has developed an annoying quirk. When starting up with any disk, it beeps as the menu bar appears, before the disk icon appears. And the apple in the menu flashes continuously, which is distracting. Any idea what's happening?

Michael Maiman
San Francisco, California

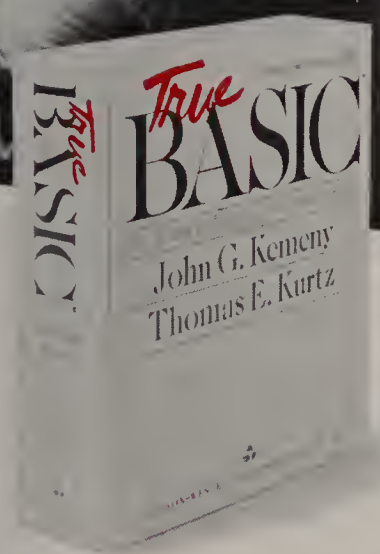
A. Your Mac's alarm clock has gone off. To turn off the alarm, open the Alarm Clock desk accessory. It reports the time of day, the date, if the alarm is set, and when the alarm will go off. This desk accessory also enables you to set and adjust those items. The clock is accurate to within a second or so each day. It keeps running when the Mac is switched off, thanks to a self-contained, long-life battery.

When you choose Alarm Clock from the Apple menu, you see a digital clock that reports the time of day. Clicking the small lever on the right drops the other two parts of the Alarm Clock into view. Selecting the icons at the bottom of the display lets you view or change the time of day, the date, or the alarm setting.

Check the alarm by clicking the alarm clock icon. The time at which the alarm is set to ring appears in the middle section above the icon, with an on/off button to its left. Click the button down to turn the

(continues on page 82)

A structured programming language you'll really feel comfortable with.



You know John Kemeny and Tom Kurtz. They developed the original BASIC. Now they're back with an even better version: a flexible, easy-to-use structured programming language they call True BASIC.™

True BASIC offers a full selection of control structures. External procedures can be compiled into libraries, making True BASIC faster and more powerful than any other programming language.

True BASIC has a complete matrix algebra package and the best graphics ever in a higher level language. And there are optional libraries for things like sorting and searching and 3-D graphics.

True BASIC programs run on any computer which runs True BASIC, good news for users with more than one kind of PC.

You'll love True BASIC. Whether you're programming for your own applications, teaching others, or developing products to go to market, send in the coupon below to receive a free demo disk.

Available for the IBM-PC™ and compatibles, Apple Macintosh,™ and Commodore Amiga.™

To order, talk to your local dealer or call (603) 643-3882 TODAY!

True BASIC™ inc.
39 South Main Street,
Hanover, NH 03755 (603) 643-3882

My computer is: ☐ IBM-PC/compatible
☐ Apple Macintosh
☐ Commodore Amiga

☐ I'D LIKE TO GET MY FREE DEMO DISK.
☐ I'd like more information on the True BASIC language products.
☐ I'm ready to buy. Call me and tell me how.
☐ I'd like information on True BASIC Mathematics Series and other products.

Name _____
Title _____
Company/University _____
Address _____
City, State, ZIP _____
Telephone _____

Suggested retail price $149.90
Educational site licenses available from Addison-Wesley Publishing.

True BASIC Language System is a trademark of True Basic, Inc.
Macintosh is a trademark of Apple Computer Corp.
Amiga is a trademark of Commodore Business Machines.
IBM is a trademark of International Business Machines Corp.

Circle 469 on reader service card

MedQuest

Medical Office Management for the Macintosh™

Written by

Michael Sanders, M.D.

Major Features

- Patient and 3rd Party Billing
- IPA Management
- Clinical Problem & Procedure Tracking
- Historical Recall
- Ad Hoc Reporting
- Appointments
- Practice Analysis by Doctor, Procedure, Carrier
- Supports Multi-Physician Clinic
- Multi-User Version Available
- No Limits on # of Patients, Problems, Procedures
- Follows Mac Interface
- Developed with Omnis 3
- Easy to Learn, Easier to Use
- Monthly Newsletter and Continuing Support

$995

MedQuest

Box 220
Laurel, Md. 20707

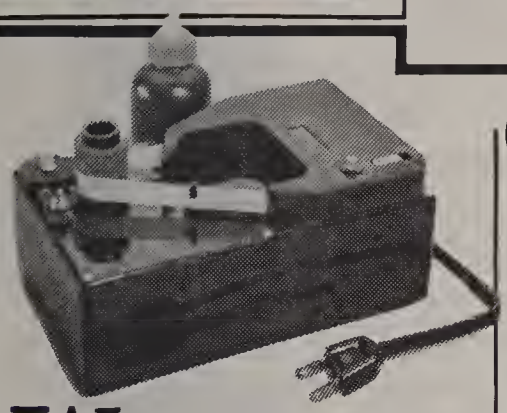
(301) 792-2735 {24 hour phone}

Macintosh is a Trademark licensed to Apple Computer, Inc.
Omnis 3 is a Copyright of Blyth Software, Ltd.

Circle 505 on reader service card

MAX YOUR MAC

WITH BEDE TECH 800/772-4536



WOULD YOU PAY $49 FOR A LIFETIME RIBBON SUPPLY?

MAC ImageWriter Ribbon RE-INKER

Motorized Ribbon Re-Inker silently re-inks all ImageWriter I and II fabric ribbons again and again. Better print quality than new ribbons. Our special lubricated black ink actually extends print head life. Built to last. Simple to run. Saves a bundle.

MAC ImageWriter Ribbon Re-Inker
Bede Tech Bonus • 4 Oz. Bottle Black Ink, Roller & Roller Cover.
BEDE TECH DIRECT $49.00
Reg. $67 Value

INK AND RIBBON SAVINGS

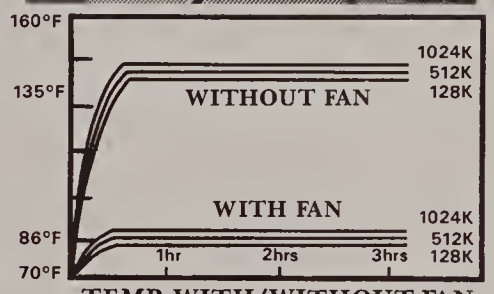
4 Oz. Bottle Black Ink	$ 4.50
2 Oz. Bottle Colored Ink	$ 4.50
Pint of Black Ink	$16.50
Gallon of Black Ink	$75.00
Color Ink Kits (2 Oz. ink, uninked roller, roller cover)	$ 8.00
Uninked Roller w/Cover	$ 3.50
ImageWriter Ribbon Cartridge (box of 2 uninked ribbons)	$10.00
ImageWriter Ribbon Cartridge (box of 2 inked ribbons)	$12.00
Print Head Cleaning Kit	$ 9.95
Re-Inker Shut-Off Timer (for high volume users)	$24.00
ImageWriter Silence Pad	$11.25

MOUSE PAD

Your mouse will work faster and live longer. Anti-static, designer blue surface, 9-3/8" x 7-1/8" with thick foam pad.
BEDE TECH DIRECT $7.95
Reg. $9.95 Value

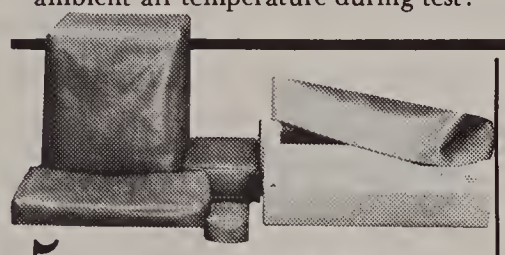
COOLER COMPUTERS LIVE LONGER

Built without its own fan, your MAC is prone to overheating. High temperatures can cause component failure or even burn out your power supply circuit board. Tests show our fan significantly reduces the temperature inside your MAC. It installs into the recessed Macintosh handle in one second. It runs whisper quiet. Intelligently designed by **Steve Beck's Beck-Tech,** with built-in surge protector and top-mounted switch that controls both fan and MAC. PATENT PENDING
BEDE TECH DIRECT $79.00
Reg. $129.95 Value



TEMP. WITH/WITHOUT FAN

Temperature measured inside top left and right side of MAC with LM35 temperature sensor. 75° average ambient air temperature during test.



5-PIECE PREMIUM CUSTOM COVER SET

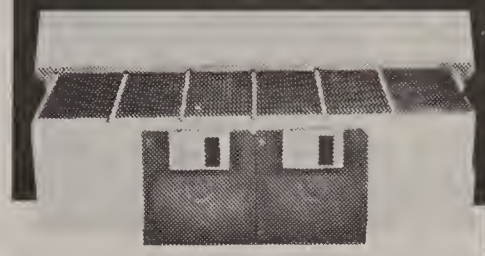
These heavy-duty, earth toned, decorator vinyl covers will be custom fitted to your individual MAC and MAC PLUS components. A must for dusty conditions, offices and homes with forced air heating. Call With Your Mac Hardware Model Numbers.

5-PIECE PREMIUM COVER SET.
BEDE TECH DIRECT $49.00
Reg. $79 Value

KEYBOARD COVERS

Sturdy, Mac-colored, hard covers protect your MAC or MAC PLUS keyboard and number pad from dust, dirt, spills and damage. Specify MAC or MAC PLUS.
Bede Tech Bonus • MAC Keyboard Command Reference Charts!
BEDE TECH DIRECT $12.50
Reg. $17.50 Value

brown disc



TWO-FOR-ONE LIFETIME WARRANTY + FREE DISC ORGANIZER

Brown Disc has built a reputation for superior quality and error-free performance among OEM customers. Discs are 100% certified and exceed ANSI standards! These are the finest discs in the world. We prove it with a two-for-one lifetime warranty: If any Brown Disc diskette fails to perform due to defects in materials or workmanship, Brown Disc will replace the defective diskette with two diskettes of the same type.

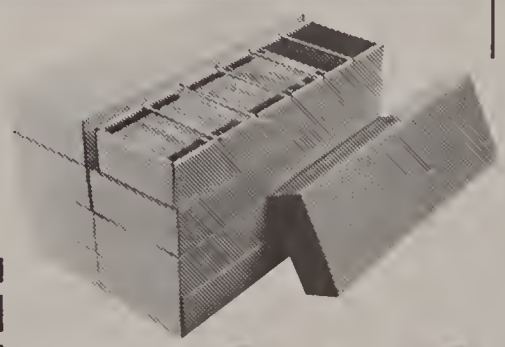
Bede Tech Bonus • All Discs Shipped in FREE $9.95 Value Disc Organizer

100 SS, 3.5" Discs
BEDE TECH DIRECT $189.00
50 SS, 3.5" Discs
BEDE TECH DIRECT $104.00
10 SS, 3.5" Discs
BEDE TECH DIRECT $ 28.30

CALL FOR ADDITIONAL QUANTITIES, DOUBLE SIDED AND 5.25" DISC PRICES

DISC ORGANIZER • SAVE BIG WITH FOUR-PAK

Each extra sturdy 200 lb. test corr. bd. disk organizer holds up to 100 3.5" or 5.25" disks. Comes with removable dividers, cover. Glossy white dirt-resistant surface. Stackable!
BEDE TECH DIRECT Save! Four-Pak $27.95 • Reg. $39.80 Value
BEDE TECH DIRECT Single Disk File $7.95 • Reg. $9.95 Value



MADE IN AMERICA • 30-DAY SATISFACTION MONEY-BACK GUARANTEE

QTY.	ITEM	TOTAL
		$
		$
		$
		$
		$
		$
PURCHASE TOTAL		$
Shipping and Handling Charge (Canada $4.50 S&H)		$ 1.50
Ohio residents add 6.5% Sales Tax		$
TOTAL ORDER		$

Send check, money order or charge it

☐ VISA ☐ MasterCard Exp. Date _____
Card No. _____
Signature _____
Name _____
Address _____
City _____
State/Zip _____

ImageWriter is a registered trademark of Apple Computer, Inc.
Macintosh and MAC are trademarks licensed to Apple Computer, Inc.

Circle 490 on reader service card

bede tech

CALL TOLL FREE
800-772-4536
In Ohio 216-631-4214
8327 Clinton Road
Cleveland, Ohio 44144

© 1986 Bede Tech

(continued from page 78)

alarm off. When the on/off button is up, the alarm is set, and short lines radiate from the top of the alarm clock icon to suggest that the bell is ringing (see "Alarm Clock").

To change the alarm setting, click any element in the digital display next to the on/off button—hours, minutes, seconds, or AM/PM. An adjustment button with arrows pointing up and down appears that lets you adjust the selected element. Click to change the number one unit at a time; press to spin ahead rapidly. Alternatively, you may set the time by typing. You cannot change AM or PM by typing, however, so you must type the time in 24-hour format (for example, 19:15:00 for 7:15 PM). Press the Tab key to move from hours to minutes and from minutes to seconds.

Edit by Columns

Q. In *MacWrite* how can I enter and edit text in columns without having the changes in one column affect other columns? I am writing a reference book on functional analysis, and I am arranging my entries alphabetically. Since *MacWrite* treats the contents of a page as continuous text, editing by columns is impossible.

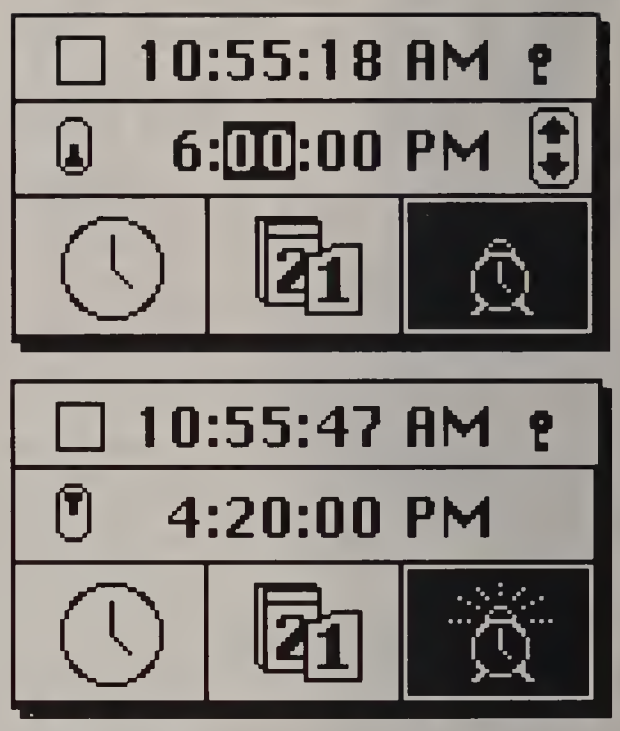
James S. Hellen
Wayne, New Jersey

A. The only Macintosh word processor I know of that permits typing, editing, and printing in columns is *Haba Word,* which was scheduled for release in March. It shows columns on screen as they will be printed and lets you resize, move, insert, and delete columns. *MacWrite* 4.5 can't work in columns, and *Microsoft Word* 1.05 only prints in columns.

Haba Word uses two column schemes. One scheme flows text to the next column on the right when you reach the end of a page, like the columns in a magazine. The other scheme maintains columns across pages like a spreadsheet.

Speaking of which, have you considered typing and editing text in the columns of a spreadsheet? Just ignore the formula calculation capabilities and use the column manipulation features. Most spreadsheet

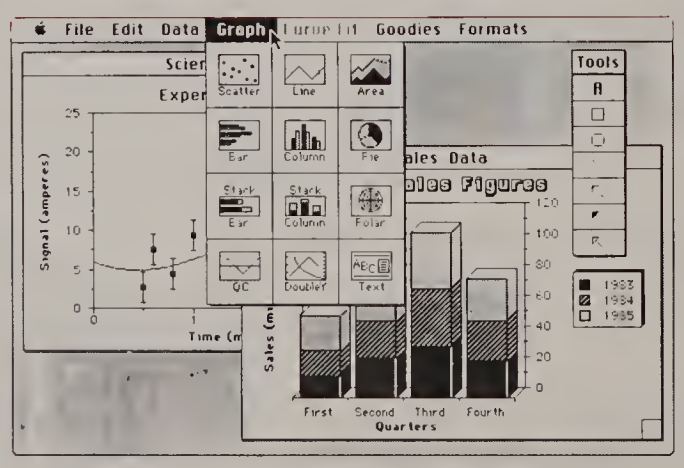
(continues on page 87)



Alarm Clock
This desk accessory shows the current time and date and when the alarm is set to go off. Silence the alarm by clicking the on/off button located to the left of the middle display.

cricket GRAPH

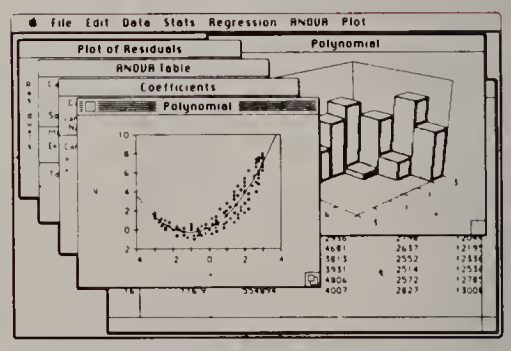
The most revolutionary business & scientific graphics package available for the Macintosh™ !



ONLY $195.00 DEMO $6.95

- Sixteen bar patterns & plot symbols
- Selection of fonts, sizes & styles
- Text, lines & arrows added anywhere
- Large data sets of 2000 or more points
- Regression curve fits
- Error bars (both x & y)
- Enter & edit data quickly
- Easy importing of data
- **Graphic Macros** for speed & ease
- Quality Control Charts (8 types)
- Position and size each graph on the page
- Multiple graphs per page
- Overlay one or more graphs
- Print on ImageWriter or LaserWriter
- **Color graphs** using . . . Color plotters (HP & others)
- Special version available for film recorders

StatWorks™



ONLY $125.00
DEMO $6.95

A statistical package designed with a wide variety of applications that you don't need to spend hours learning.

cricket software 215 • 387-7955
3508 Market St. Suite 206 • Philadelphia, PA 19104

for ordering or to have a brochure sent

1-800-345-8112

In PA **1-800-662-2444**

Requires 128K. ImageWriter and LaserWriter are trademarks of Apple Computer, Inc

Circle 384 on reader service card

MacServe.
For those who understand the power of sharing.

It's called teamwork. All the members of a team benefit from sharing knowledge and resources.

Now your workgroup can take advantage of an easy to use and reliable way to share your choice of hard disks and printers. Not only will your teamwork improve exponentially, but you'll save lots of money while you make each member of your group a Power User. Then watch what MacServe does for the prosperity and morale of your operation!

Increase productivity

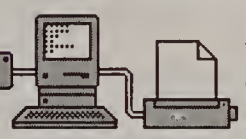
Everyone in your group will benefit from direct access to common databases (such as Omnis 3) and libraries of documents. And, MacServe's printer spooling is a great relief, because you can share a printer and still get back to work sooner.

Reliable and Convenient

MacServe lets you divide hard disks into segments or "volumes" with speed and security advantages even for single Macintosh configurations. It's faster than

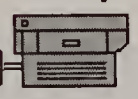
accessing a whole disk and much more reliable than any file serving scheme yet devised. And disk sharing is incomparably more convenient than using and swapping floppies with your colleagues!

The complete Apple network



MacServe networking software and Apple's Hard Disk 20 finally make Apple networking a reality. But MacServe does not limit you to Apple's hard disks and printers —your group can also share any of the leading hard disks—and all at the same time. Add more Macs, disks, and printers as you need them. MacServe requires no special or dedicated hardware.

Call your Apple dealer now



By April 15, leading Apple dealers will be delivering a networking system that really works. MacServe has arrived.

MacServe™

Sharing Resources through AppleTalk

MacServe is a trademark of Infosphere, Inc. Macintosh is a trademark licensed to and AppleTalk is a trademark of Apple Computer. Omnis is a trademark of Blyth Holdings, Ltd.

INFOSPHERE

4730 S.W. Macadam Ave., Portland, Oregon 97201
503/226-3620

Circle 249 on reader service card

IN STATISTICS,
LESS IS MORE

SYSTAT™, the first company to port a mainframe statistics package to microcomputers, has now been joined by BMDP™, SAS™, and SPSS™. Now you have a choice. You can buy a lot of package to do a little statistics or a little package to do a lot of statistics. In statistics, as in art, less is more.

What's less?

Less to learn. SYSTAT has less than half the commands.

Less to wait. SYSTAT is faster on big and small problems

Less to spend. SYSTAT's single user and site license prices are lower.

Less memory. SYSTAT uses less RAM. And *much* less disk space. It even works on floppy disk systems.

What's more?

More statistics. SYSTAT Version 3.0 has more statistical capabilities than *any* microcomputer statistical package. It even has more than mainframe BMDP, SAS/STAT, or SPSS.

More machines. SYSTAT operates on IBM™ PC's and compatibles, generic MS-DOS™ machines like the HP-150™, Wang™ and DEC Rainbow™, on CP/M™ machines, on several UNIX™ minicomputers and mainframes, on the VAX 11/780™, and even on the Apple Macintosh™.

More accuracy. SYSTAT's regression routines have been proven more accurate than SAS PROC GLM, SAS PROC REG, BMDP1R, BMDP2R, and SPSS REGRESSION on micros *or* mainframes.

More variables. On a 512K microcomputer, SYSTAT can compute regressions and other statistical analyses on more variables than any other microcomputer statistical package.

To evaluate a statistical software package seriously, you should look beyond brand name or marketing hype to find a program that will give you the accurate results you need. Ask for the booklet "STATISTICS QUIZ" which contains simple problems you can run to reveal bugs and serious deficiencies in mainframe and microcomputer statistical packages. We want to help you get a package that gets the correct answer.

SYSTAT capabilities include:

- Full screen spreadsheet data editor
- Missing data, arrays, character variables
- Unlimited cases
- Process hierarchical files and variable length records
- Rectangular and triangular files
- Relational database management and report generation
- Character, numeric, and nested sorts
- Merge and append large files
- Unlimited numeric and character transformations
- Optional programming language
- Interactive or batch
- Read and write text and external files
- Subgroup processing in statistical modules with SELECT and BY
- Value labels
- RECODE statements for quick multiple codes
- Scatterplots, contours, histograms, stem-and-leaf, boxplots, bar charts, quantile, probability plots
- Basic statistics, frequencies
- T-tests
- Multi-way crosstabs with log-linear modeling, association coefficients, PRE statistics, asymptotic standard errors
- Pairwise/listwise missing value correlation, SSCP, covariance, Spearman, Gamma, Kendall Tau, Euclidean distances
- Linear, polynomial, multiple, stepwise, weighted regression
- Extended regression diagnostics
- Multivariate general linear model
- Multi-way ANOVA, ANOCOVA, MANOVA, repeated measures
- Post-hoc tests
- Principal components with rotations and scores
- Multidimensional scaling
- Multiple and canonical discriminant analysis. Bayesian classification
- Cluster analysis (hierarchical, single, average, complete median, centroid linkage, k-means, cases, variables)
- Nonparametric statistics (sign, Runs, Wilcoxon, Kruskal-Wallis, Friedman two-way ANOVA, Mann-Whitney U, Kolmogorov-Smirnov, Lilliefors, Kendall coefficient of concordance)
- Time Series (smoothing, seasonal and nonseasonal ARIMA, ACF, PACF, Crosscorrelation function, transformations, forecasting, Fourier analysis)
- Nonlinear estimation (nonlinear regression, least absolute values regression, logit, probit, maximum likelihood estimation, iteratively reweighted least squares)
- Non-copy-protected version available
- Micro, mini, and mainframe versions

Macintosh interface version available.

Single copy price:
$595 USA and Canada, $695 Foreign
Site licenses and quantity prices available.

Call or write for additional information

SYSTAT, Inc.
2902 Central Street
Evanston, IL 60201

312 **864.5670**

SYSTAT™

Circle 491 on reader service card

If you compute after dark...

...switch to the magic of GEnie™ and stay on-line longer, for less!

Introducing GEnie, the General Electric Network for Information Exchange. It's part of General Electric Information Services—the largest commercial teleprocessing network.

Now the power of GEnie stands ready to bring a little magic into the life of PC owners just like you. And for potentially much less than other on-line information services.

With GEnie, you pay no hidden charges or monthly minimum fees. You pay only for the actual time you're on-line and the $18.00 registration fee. Nothing more.

Compare & Save

	Services						Pricing			
	SIGs/User Groups	Electronic Mail	CB Simulator	Computing News	Games	2400 baud access	Registration fee	Monthly minimum	Non-prime time rates 300 baud	Non-prime time rates 1200 baud
GEnie*	**X**	**X**	**X**	**X**	**X**	**X**	**$18.00**	**none**	**$5.00**	**$5.00**
CompuServe	X	X	X	X	X	X	$39.95	none	$6.25	$12.75
The Source	X	X	no	X	X	X	$49.95	$10.00	$8.40	$10.80

**Rates and Services shown in effect 12/85. Non-prime time rate applies Mon–Fri, 6pm–8am local time, all day Sat., Sun., and nat'l. holidays. Subject to service availability. Additional surcharge applies for 2400 baud service.*

Save up to 60%

Check out the chart above and compare it for yourself. You'll find GEnie can deliver all of your favorite services for an incomparable price at incomparable savings!

Put the power of GEnie at your command

- Discuss the latest in computer products and accessories or download public domain software with GEnie's ***RoundTable™ Special Interest Groups.***
- Meet new people, share ideas with friends—old and new—with ***LiveWire™***, GEnie's CB simulator that has everybody talking!
- Get your message across and back again with ***GE Mail™***, GEnie's electronic mail service.
- Organize a local, regional or national get-together in one of GEnie's 40 "conference rooms" with GEnie's ***Business Band Real-Time Conferencing.***
- Go one-on-one with classic computer games, match your wits against others with multi-player games, or download for future play in GEnie's ***Game Room.***
- Stay in touch with what's new on the microcomputer scene, courtesy of GEnie's news service, ***News and Commentary.***

GEnie can take you to new highs in speed and keep you there. Because our non-prime time rate for 300 OR 1200 baud is only $5.00 an hour. And that means you save 20 to 60%. Or if you prefer, 2400 baud service is now available.

With services and prices like these—talk, read, learn, or play to your heart's content. Because now you can keep your eyes on the screen, not on the clock.

With your personal computer, modem, communications software, and telephone, you already have everything you need to make GEnie come to life. You'll receive FREE OF CHARGE—3 hours of non-prime time use—a $15.00 value.

So why not Sign-Up today with this special offer, let GEnie bring a little magic into your life!

3 FREE Hours When You Sign Up From Your Keyboard Before May 31st— 4 Easy Steps:

1. Have ready your VISA, MasterCard or checking account number to set up your personal GEnie account.
2. Set your modem for half duplex (local echo)—300 or 1200 baud.
3. Dial **1-800-638-8369.** When connected, enter HHH
4. At the U# = prompt, enter **5JM11986,GENIE** then RETURN.

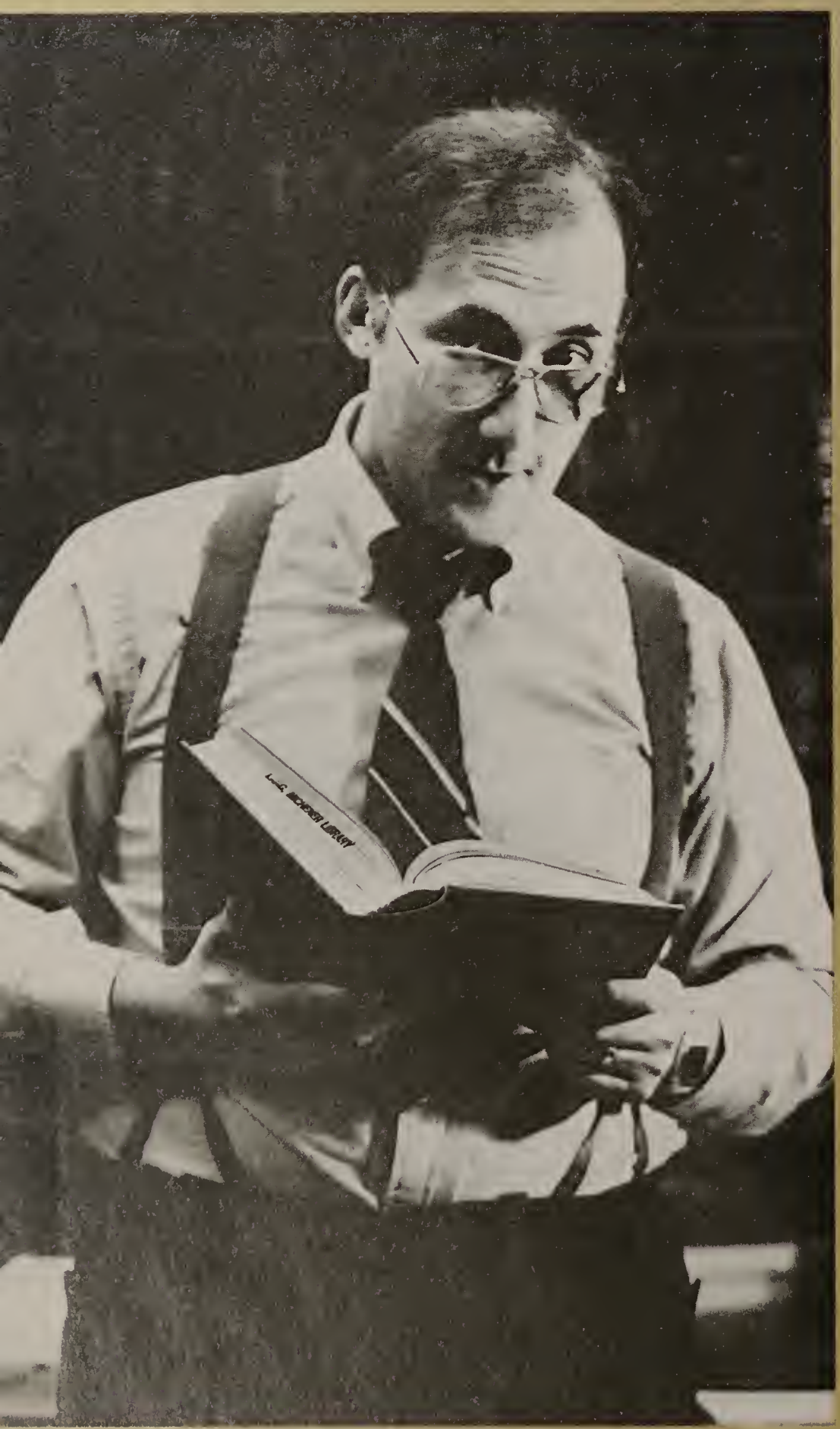
No Modem Yet? Need more information or assistance? We can help! Call **1-800-638-9636, ext. 21.**

Get on-line with GEnie. And stay longer, for less.

INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

Gold Collar Worker



Photographed by Brian Thompson at the law library of Lang, Michener, Toronto, Ontario.

Name: Bruce Lewis.
Profession: Managing partner, major Canadian law firm.
Hobby: Crafting reproduction William and Mary furniture.
Work style: Perfectionist. Demands 100% accuracy, superior quality and appearance in every legal document.
Computer of choice: Macintosh™ with a LaserWriter. Placed 65 Macintosh computers on the desks of both lawyers and staff. Networked them to share 9 LaserWriters. Plans to buy 100 more Apple computers this year.
Favorite software: Document Modeler™, a powerful expert system toolbox for documents. It enables Bruce to "clone" his 12 years of legal experience to assist other lawyers and staff. And it saves time.
First application: Bruce constructed a model of the dozen or so letters usually required for real estate transactions. The model prompts a secretary, step-by-step, to input every relevant particular of a transaction and then automatically performs any calculations, assembles the appropriate clauses and produces impeccable letters customized to the client's individual needs, precisely as Bruce specified. Result: a 35 minute job reduced to 10 minutes.
Next application: More document models, this time for more complex documents.

Bruce Lewis. One of a new breed of "gold collar workers"* who is boosting professional and managerial productivity with advanced knowledge-management tools.

Become a gold collar worker. Contact the Model Office Company™. Phone: 1 800 268-8181, our toll free number in Canada and continental U.S. Or write: The Model Office Company, The Gooderham Flatiron Building,
49 Wellington St. East,
Toronto, Ontario,
Canada, M5E 1C9.

THE MODEL OFFICE COMPANY

*Robert E Kelley, *The Gold Collar Worker*, Addison-Wesley, 1985. Document Modeler is a trademark licensed to, and The Model Office Company is a trademark of, The Model Office Company Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. and is used with its express permission.

Circle 426 on reader service card

(continued from page 82)

programs even let you enter lines out of order; the program sorts them for you. When you have arranged the text to your satisfaction, copy it from the spreadsheet and paste it into *MacWrite,* where you can make font and style changes. When you paste spreadsheet information into a word processing document, the columns align on the tabs you have set.

File Flags

Q. I've used the *SetFile* desk accessory a number of times to retrieve a lost document by changing its type and creator. I've often wondered about the meaning of the document descriptors, such as Inited, Busy, and of course Bozo. Can you fill me in?

Tim Kraft
Canton, Ohio

A. Every disk sets aside space for a file directory, which keeps track of file descriptions and locations. The description of each file includes a standard set of file flags, including the Inited, Busy, and Bozo flags you mentioned (see "File Flags Table").

You set the flags on or off using the *SetFile* desk accessory or the *Fedit* program. Most user groups offer both *SetFile* and *Fedit* as shareware. You can order *Fedit* for $30 from John Mitchell, 939 E. El Camino Real #122, Sunnyvale, CA 94087. *SetFile* is available for $10 from Fred, Sam, and Dave Software, 1442A Walnut St. #153, Berkeley, CA 94709, 415/849-9114.

Flag	Meaning
Protected	The Finder cannot duplicate this file or move it to the trash or to another folder or disk.
Locked	The Finder cannot remove, rename, or replace this file.
Invisible	The Finder does not display this file's icon.
Bundle	This file contains an icon list, file references, and version data resources, which the Finder copies into its desktop file to display the proper icon for the file and its related documents.
System	This is a System file.
Bozo	This file is protected by a copy-protection scheme so outdated that Finder 5.0 ignores it.
Busy	The file is open.
Changed	The file has been changed since it was last saved and ought to be saved again before closing it or quitting.
Inited	This file's icon has been assigned a location on the Finder's desktop.

File Flags Table
A key to the descriptors that flag every file on disk. You can read file flags using the SetFile *desk accessory or a program like* Fedit.

Imagewriter Prints Only U's

Q. Sometimes my Imagewriter prints only *U*'s, a whole line of them, over and over. This unseemly behavior happens on and off with several programs. The Imagewriter passes its self-test and works fine with a friend's Mac. What gives?

Paula Wilkes
Charleston, South Carolina

A. The unique printing you describe occurs when you try to print a document on an Imagewriter after using a disk that was set up for the LaserWriter with AppleTalk connected. You need not have actually printed anything on a LaserWriter, but the following conditions must have occurred in the order stated.

- When you last used the Choose Printer desk accessory on the LaserWriter disk, you selected the AppleTalk Connected option.
- You started up with a LaserWriter disk when you last turned on the Mac, or you made a LaserWriter disk the startup disk since then.
- You shut down the Mac with the MiniFinder's Shut Down button or the Finder's Shut Down command, or you pressed the Reset button on the side of the Mac, and then started up with an Imagewriter disk.
- You tried to print on an Imagewriter attached to the printer port.

Once the AppleTalk Connected option has been set, it cannot be removed by changing application programs, switching disks, shutting down, or pressing the Reset button. You must use the Choose Printer desk accessory or turn the Mac off. However, Choose Printer lets you change the AppleTalk setting only on a LaserWriter disk.

It's surprising that turning off the Mac disconnects AppleTalk. It's the only documented difference I know of between pressing the Reset button and switching the power off. Further, the AppleTalk Connected/Disconnected setting is recorded in a special area of memory called parameter RAM that is kept alive by the clock battery. Theoretically, you should have to turn off the Mac and remove the battery for a minute or so to disable the setting. Remove the battery in case the printing problem persists after turning off the Mac. If you remove the battery, you must reset the clock, the calendar, and the features controlled through the Control Panel desk accessory.

Get Info *answers questions about the Macintosh and how it works. When you need advice about using the Mac, drop me a line. I cannot respond to all letters, but I will answer the most representative questions. Send your question about the Macintosh, Macintosh software, and Macintosh programming to* Get Info, Macworld, *555 De Haro St., San Francisco, CA 94107. Send electronic mail to CompuServe 70370,702 or The Source BCW440. All published submissions become the property of* Macworld.

Lon Poole is a Contributing Editor of Macworld. □

MacConnection

SOFTWARE

Addison-Wesley
Smart Eyes *(speed reading tutor)* ..... $36.
Affinity Microsystems
Tempo *(power user's macro utility)* ..... 79.
Altsys
Fontastic *(create your own fonts)* ..... 27.
Apropos
Financial Planning *(reqs. Multiplan)* .... 45.
Investment Planning *(reqs. Multiplan)* ... 45.
Tax Planner *(requires Excel)* ..... 35.
Arrays/Continental
Home Accountant *(reqs. external drive)* 52.
Assimilation
Mac·Tracks *(macro utility)* ..... 22.
Mac·Memory·Disk *(reqs. 512k)* ..... 22.
MIDI Composer *(music record/playback)* 22.
Work·N·Print *(print spooler)* ..... 22.
Business·Essentials *(correspondence)* .. 65.
Mac·Spell·Right *(40,000 word dictionary)* 69.
Right·Word *(spell checker & thesaurus)* 69.
ATI
Teach Yourself Multiplan ..... 39.
Jazz Training ..... 39.
Excel Training ..... 39.
Batteries Included
The Mac BatteryPak *(desk accessories)* 27.
Blyth Software
Omnis 3 *(requires 512k, external drive)* 259.
Borland International
Sidekick *(unprotected)* ..... 44.
Sidekick w/Phonelink ..... 59.
BrainPower
PowerMath *(requires 512k)* ..... 52.
StatView *(statistics package)* ..... 99.
CAMDE
Nutricalc *(diet & nutrition analysis)* ..... 49.
Casady Company
Fluent Fonts *(two-disk set)* ..... 29.
Central Point Software
Copy II Mac *(includes MacTools)* ..... 20.
Challenger Software
Mac3D *(3D graphics, CAD features)* .. 125.
Chang Labs
Rags to Riches Ledger ..... 99.
Rags to Riches Receivables *(reqs. 512k)* 99.
Rags to Riches Payables *(reqs. 512k)* .. 99.
Rags to Riches Three Pak ..... 249.
Creighton Development
MacSpell+ *(requires 512k)* ..... 55.
DataFood
DrawForms *(requires MacDraw)* ..... 30.
MacForms *(requires MacPaint)* ..... 42.
Datavis
MacLink *(transfer Mac/IBM files)* ..... 89.
Digital, Etc.
Maccountant ..... 99.
Dilithium Press
PC to Mac & Back *(link your PC)* ..... 99.
Dow Jones
Straight Talk ..... 59.
Spreadsheet Link ..... 62.
Market Manager PLUS ..... 125.
Dreams of the Phoenix
Day Keeper Calendar ..... 27.
Mouse Exchange BBS ..... 27.
Mouse Exchange Terminal ..... 27.
Quick & Dirty Utilities Vol. 1 ..... 27.
Quick & Dirty Utilities Vol. 2 ..... 27.
Twelve-C Financial Desk Accessory .... 27.

Electronic Arts
Financial Cookbook ..... $32.
Deluxe Music Construction Set ..... 32.
Enterset
Quickpaint *(find MacPaint files fast)* .... 29.
Quickset *(icon-driven accessory)* ..... 29.
Quickword *(word processing tool)* ..... 32.
1st Byte
Speller Bee *(spelling-learning tool)* ..... 42.
KidTalk *("talking notebook")* ..... 42.
Smoothtalker *(version 2.0)* ..... 52.
Forethought
Typing Intrigue *(typing instruction)* ..... 29.
Factfinder *(free-form entry)* ..... 84.
FileMaker ..... special
Fortnum/Southern
MacInooga Choo-Choo *(reqs. 512k)* ... 21.
MacNest *(double screen scrapbook)* ... 25.
MacChemistry ..... 89.
Great Wave Software
The Art of Fugue *(Bach)* ..... 12.
Comet Halley ..... 18.
ConcertWare+ *(music composition)* ... 39.
Greene, Johnson
Spellswell *(incl. homonym dictionary)* ... 29.
Harvard Associates
MacManager *(business simulation)* ..... 29.
Desktoppers *(new desk accessories)* .. 29.
Hayden Software
DaVinci Buildings ..... 29.
DaVinci Interiors ..... 29.
DaVinci Landscapes ..... 29.
DaVinci Building Blocks ..... 46.
DaVinci Commercial Interiors ..... 114.
Art Grabber with Body Shop ..... 29.
Turbo Turtle ..... 35.
I Know It's Here Somewhere ..... 35.
MusicWorks ..... 45.
Hayden:Speller ..... 45.
Score Improvement System for the SAT 57.
VideoWorks ..... 57.
Hippopotamus Software
Hippo Computer Almanac ..... 20.
Hippo-Lock *(file security program)* ..... 62.
Hippo-C - Level 1 ..... 78.
Hippo-C - Level 2 ..... 208.
Ideaform
MacLabeler *(print disk labels)* ..... 29.
Innovative Data Design
Paste-Ease *(requires MacPaint)* ..... 35.
MacDraft *(requires 512k)* ..... 139.
Kensington
Graphic Accents ..... 29.
Type Fonts for Text ..... 29.
Type Fonts for Headlines *(reqs. 512k)* .. 42.
Layered
Front Desk *(scheduling & organizer)* ... 77.
Legisoft/Nolo Press
WillWriter *(prepare your own will)* ..... 27.
Linguist's Software
MacCyrillic ..... 39.
SuperFrench/German/Spanish ..... 39.
Tech *(1000 different symbols)* ..... 59.
MacArabic ..... 59.
MacKana/Basic Kanji ..... 59.
MacSemitic/Coptic/Devanagari ..... 59.
MacKorean ..... 59.
SuperGreek ..... 59.
SuperHebrew ..... 59.
SuperGreek/Hebrew/Phonetics ..... 89.

Living Videotext
ThinkTank 128k ..... $52.
ThinkTank 512k *(outline processor)* ... 101.
Magnum
McPic - Volume I ..... 28.
McPic - Volume II ..... 28.
The Slide Show Magician ..... 34.
Manhattan Graphics
Ready Set Go *(requires 512k)* ..... 125.
Mark of the Unicorn
Professional Composer *(reqs. 512k)* ... 249.
Microsoft
Entrepreneur ..... 29.
Learning Multiplan and Chart ..... 37.
Chart 1.05 ..... 72.
Logo 1.0 ..... 75.
Basic 2.1 ..... 87.
Multiplan 1.1 ..... 105.
File 1.02 ..... 111.
Word 1.05 ..... 111.
Multiplan to Excel Upgrade ..... 150.
Fortran 2.1 ..... 169.
Excel 1.0 ..... 225.
Miles Computing
Mac the Knife - Volume I ..... 21.
Mac the Knife - Volume II ..... 25.
Mac the Knife - Volume III ..... 27.
Mindscape
The Perfect Score: SAT ..... 47.
Monogram
Forecast *(tax planning)* ..... 40.
Dollars & Sense ..... 81.
Nevins Microsystems
Turbocharger *(requires 512k)* ..... 55.
New Canaan MicroCode
Mac Disk Catalog II ..... 32.
Odesta
Helix *(requires 512k, external drive)* .. 219.
Organizational Development
Consultant *(idea management)* ..... 115.
Palantir
MacType *(supports Dvorak keyboard)* .. 26.
MathFlash *(math flash card drills)* ..... 26.
WordPlay *(crossword puzzles)* ..... 26.
Accounts Receivable ..... 69.
General Ledger ..... 69.
Inventory Control ..... 69.
inTouch *(communication to emulation)* .. 79.
PBI Software
Icon Switcher ..... 14.
Icon Fun & Games Library ..... 14.
Icon Business Library ..... 14.
Peachtree
Back to Basics General Ledger ..... 88.
Accounts Payable ..... 88.
Accounts Receivable ..... 88.
Polarware
Graphics Magician ..... 47.
Practial Computer Applications
MacBackup *(free upgrades)* ..... 41.
ProVUE Development
OverVUE 2.0 *(power-packed database)* 149.
QED Information Sciences
Typing Made Easy ..... 36.
Rubicon Publishing
Dinner At Eight *(recipes to wines)* ..... 35.
Satori
BulkMailer *(mailing lists)* ..... 79.
Scarborough Systems
Mastertype *(arcade typing tutorial)* ..... 25.

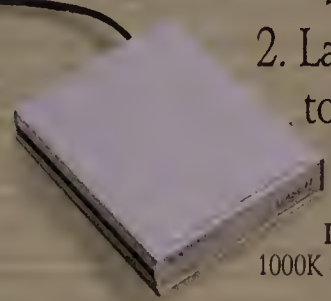
Gilding the lily.

Is it real, or is it Marlow? It's quiz time! Get your mice and Macs ready. It's time to find out how good a job we're doing convincing you that we're the best thing to happen to mail order since the Pony Express! Each of the following statements is either true or false.

Excel $225
World's largest spreadsheet

1. That beautiful picture of our home town, Marlow, NH (pop. 552) was completely created and digitally enhanced on a Macintosh computer. T ☐ F ☐

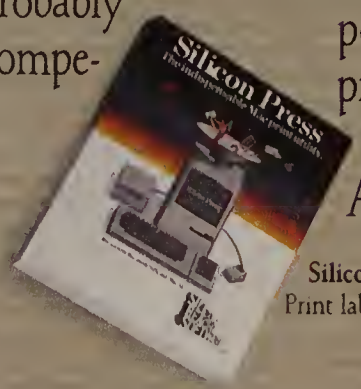
2. Last week we tore down those old useless buildings to make room for a new MacConnection parking lot. T ☐ F ☐



Dasch $699
1000K external RAMdisk

3. Our corporate headquarters is really in downtown Los Angeles, and this whole Marlow thing was a clever little bit thought up by our advertising people. T ☐ F ☐

Dare to be normal.
And now for your score. If you said any one of the above is true, you are a *bona fide* skeptic. If you said two of the above are true, you probably work for the competition, and are indulging in a little wishful thinking. And if you said all three are true, then we regret to inform you that little blue men with ion generators are waiting in your kitchen to vaporize you after breakfast.



Silicon Press $42
Print labels of any size

By the way, Spring *has* sprung in scenic Marlow. The local teenagers have very suspicious smiles on their faces. The grownups don't look so innocent either. And here at MacConnection, we're positively bursting. . .with prices and service beyond your wildest imagination. And that's the truth.

MacLightning $53
Instant spell checker!

MacConnection™

14 MILL STREET, MARLOW, NH 03456 1-800/Mac&Lisa or 603/446-7711

©Copyright 1986 Micro Connection, Inc. MacConnection is a division of Micro Connection, Inc. MacConnection and Micro Connection are trademarks of Micro Connection, Inc.

makes Macs much

Sierra On-Line
MacOneWrite *(cash disbursements)* . . . $137.
MacOneWrite *(accounts receivable)* . . . 137.
Silicon Beach Software
Accessory Pak 1 . . . . . 21.
Silicon Press *(printer utility, 512k)* . . . . . 42.
Simon & Schuster
The Mac Art Department . . . . . 24.
Paper Airplane Construction Kit . . . . . 24.
Typing Tutor III . . . . . 31.
SMB Development
MacMate *(requires 512k)* . . . . . 35.
SoftStyle
Epstart . . . . . 27.
Jetstart . . . . . 27.
Toshstart . . . . . 27.
TIstart . . . . . 49.
Laserstart . . . . . 59.
Decision Map . . . . . 79.
Softview I, Inc.
MacInTax 1985 *(tax prep & planning)* . . 53.
Software Publishing
PFS:File/Report . . . . . 100.
Springboard
Art a la Mac Vol. 1-People and Places 23.
Art a la Mac Vol. 2-Variety Pack . . . . . 23.
State of the Art
Electric Checkbook . . . . . 42.
Symmetry
Picture Base *(clip art manager, 512k)* . . 48.
T/Maker
Click Art Personal Graphics . . . . . 29.
Click Art Publications . . . . . 29.
Click Art Letters . . . . . 29.
Click Art Effects . . . . . 29.
ClickOn Worksheet . . . . . 46.
Target Software
MacLightning *(reqs. 512k, external drive)* 53.
Telos Software
Filevision *(graphic filing program)* . . . . . 99.
Business Filevision *(512k, external drive)* 219.
Think Educational
Mind Over Mac . . . . . 29.
MacEdge II *(math & reading)* . . . . . 29.
Videx
MacCalendar *(incl. reminder system)* . . . 51.

GAMES

Activision
Hacker *(you're on your own!)* . . . . . 27.
Mind Shadow *(Who am I?)* . . . . . 27.
Borrowed Time *(murder mystery)* . . . . . 27.
Alter Ego *(become someone else)* . . . . . 36.
Ann Arbor Softworks
Grid Wars *(3D graphic arcade)* . . . . . 22.
Bantam Electronics
Sherlock Holmes: Another Bow . . . . . 27.

MacConnection Special of the Month
through May 31, 1986

FORETHOUGHT
FileMaker
Highly rated database to organize all your business information. Create custom forms and reports.
- Unlimited length of records or individual fields
- Spruce up your form with graphics
- Not copy-protected
For Mac, Mac Plus . . . . . $99.

Blue Chip
Millionaire *(stock market)* . . . . . 30.
Tycoon *(commodities)* . . . . . 30.
Baron *(real estate)* . . . . . 30.
Squire *(personal finance, reqs. 512k)* . . . 30.
BrainPower
Think Fast *(improves recall)* . . . . . 23.
Chipwits *(robot simulation)* . . . . . 26.
Broderbund Software
Lode Runner *(you'll never sleep!)* . . . . . 24.
Cyborg *(sci-fi text adventure)* . . . . . 24.
Ancient Art of War *(military strategy)* . . . 27.
CBS
Murder by the Dozen *(mystery)* . . . . . 25.
Electronic Arts
One on One/Dr J vs Larry Bird *(reqs. 512k)* 27.
Pinball Construction Set . . . . . 27.
Epyx
Rogue *(the mainframe classic!)* . . . . . 24.
Temple of Apshai Trilogy *(4 levels)* . . . . . 24.
Winter Games *(Olympic events)* . . . . . 24.
Gamestar
Championship Star League Baseball . . . 22.
Hayden Software
Masterpieces *(jigsaw puzzles)* . . . . . 24.
Word Challenge II *(boggle-like game)* . . 24.
Perplexx *(scrabble-type game)* . . . . . 24.
Sargon III *(9 levels of chess)* . . . . . 29.
Infocom
Seastalker *(junior)* . . . . . 24.
Cutthroats *(standard)* . . . . . 24.
Enchanter *(standard)* . . . . . 24.
Hitchhiker's Guide *(standard)* . . . . . 24.
Planetfall *(standard)* . . . . . 24.
Wishbringer *(standard)* . . . . . 24.
The Witness *(standard)* . . . . . 24.
Zork I *(standard)* . . . . . 24.
Zork II *(advanced)* . . . . . 27.
Zork III *(advanced)* . . . . . 27.
A Mind Forever Voyaging *(advanced)* . . 27.
Infidel *(advanced)* . . . . . $27.
Sorcerer *(advanced)* . . . . . 27.
Suspect *(advanced)* . . . . . 27.
Deadline *(expert)* . . . . . 29.
Spellbreaker *(expert)* . . . . . 29.
Starcross *(expert)* . . . . . 29.
Suspended *(expert)* . . . . . 29.
Invisiclues (hint booklets) . . . . . 6.
Magnum
Gypsy *(the Computer Oracle)* . . . . . 23.
Mark of the Unicorn
Mouse Stampede *(highly addictive)* . . . . 22.
Miles Computing
Fusillade *(arcade-maze)* . . . . . 21.
MacAttack *(3-D tank simulation)* . . . . . 27.
Harrier Strike *(3-D flight simulation)* . . . . . 27.
MacWars *(3-D space simulation)* . . . . . 27.
Mindscape
Rambo: First Blood Part II . . . . . 24.
James Bond 007: "A View to a Kill" . . . . 24.
Stephen King's "The Mist" . . . . . 24.
Racter *(converse with your Mac!)* . . . . . 27.
Balance of Power *(world politics)* . . . . . 30.
Brataccus *(requires 512k)* . . . . . 30.
Déjà Vu *(murder mystery)* . . . . . 33.
Origin Systems
Exodus: Ultima III *(fantasy adventure)* . . 38.
PBI Software
Feathers & Space *(arcade-style)* . . . . . 21.
Strategic Conquest *(war strategy)* . . . . . 29.
Fokker TriPlane Flight Simulator . . . . . 35.
Penguin
Transylvania *(rescue the princess!)* . . . . 24.
Crimson Crown *(sequel to above)* . . . . . 24.
The Quest *(beware of the dragon!)* . . . . 24.
Xyphus *(role playing adventure)* . . . . . 24.
Practical Computer Applications
MacGolf *(requires 512k)* . . . . . 36.
Pryority Software
Forbidden Quest *(space adventure)* . . . . 24.
Gateway *(sci-fi fantasy adventure)* . . . . . 25.
Psion
Psion Chess *(3D and multi-lingual)* . . . . . 31.
Scarborough Systems
Make Millions *(business simulation)* . . . . 29.
Sierra On-Line
Frogger *(classic video game)* . . . . . 24.
Championship Boxing . . . . . 24.
Ultima II *(role-playing adventure)* . . . . . 35.
Silicon Beach Software
Airborne! *(digitized-sound war game)* . . 20.
Enchanted Scepters *(text & graphics)* . . 21.
Sir-Tech
Mac Wizardry *(fantasy)* . . . . . 36.
Spectrum Holobyte
GATO *(submarine simulation)* . . . . . 26.
Tellstar North Level I *(reqs. 512k)* . . . . . 27.

1-800/Mac&Lisa 580C

MacConnection™

MEMBER DIRECT MARKETING ASSOCIATION

MacConnection, 14 Mill Street, Marlow, NH 03456 800/622-5472 603/446-7711

©Copyright 1986 Micro Connection, Inc. MacConnection is a division of Micro Connection, Inc. MacConnection and Micro Connection are trademarks of Micro Connection, Inc.

All items subject to availability. Prices subject to change without notice.

*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion. Some items have warranties up to five years.

Circle 4 on reader service card

more amenable.

Unicorn
Futuria *(sci-fi adventure)* ..... $24.
Utopia *(science fantasy game)* ..... 24.
Animal Kingdom *(ages 6-12)* ..... 27.
Fraction Action *(arcade style math game)* 27.
Mac Robots *(pre-school program)* ..... 27.
Read-A-Rama *(reading and spelling)* ... 32.
Videx
MacCheckers/Reversi ..... 28.
MacGammon/Cribbage ..... 28.
MacVegas ..... 34.

HARDWARE

Assimilation
Mac·Port·Adaptor ..... 85.
Mac·Epson·Connection ..... 40.
MIDI Conductor ..... 75.
Mac·Daisywheel·Connection ..... 45.
Mac·Turbo·Touch ..... 89.
Numeric·Turbo ..... 145.
Compucable
Mac to Hayes Smartmodem cable ..... 16.
Mac to Apple modem cable ..... 16.
Mac to Hayes Transet 1000 cable ..... 16.
Cuesta Systems
Datasaver AC Power Backup *(90 watts)* call
Curtis Manufacturing
Diamond *(6 outlets)* ..... 29.
Emerald *(6 outlets; 6 ft cord)* ..... 36.
Sapphire *(3 outlets; EMI/RFI filtered)* ... 47.
Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* 55.
Epson
AP-80 *(Imagewriter compatible)* ..... call
FX-85 ..... call
FX-286 *(replaces FX-185)* ..... call
LQ-1000 *(letter quality dot matrix)* ..... call
Ergotron
MacTilt *(incl. external drive bracket)* .... 75.
Hayes
Smartcom II *(communications software)* 86.
Smartmodem 1200 ..... call
Smartmodem 2400 ..... call
Transet 1000 ..... call
IOMEGA
Bernoulli Box *(dual 10-MB storage)* .. 2475.
10-Meg Cartridge ..... 48.
Head Cleaning Kit ..... 69.
Kensington
External Disk Drive Cover ..... 8.
Mouseway ..... 8.
Mouse Pocket ..... 8.
Mac Dust Cover ..... 9.
Imagewriter (II) Dust Cover ..... 9.
Mouse Cleaning Kit w/Mouse Pocket ... 16.
Universal Printer Stand ..... 17.
Disk Case *(holds 36 Mac disks)* ..... 19.
Disk Drive Cleaning Kit ..... 19.
Tilt/Swivel ..... 22.
Polarizing Filter ..... 31.
Surge Suppressor ..... 32.
Starter Pack *(includes Tilt/Swivel)* ..... 53.
A-B Box ..... 60.
Control Center ..... 61.
Koala Technologies
KAT Graphics Tablet ..... 139.
MacVision *(digitizer)* ..... 169.
Kraft
QuickStick *(Mac joystick)* ..... 45.
Microsoft
MacEnhancer 2.0 ..... $159

Mitsuba
Super 5 400k External Drive ..... 199.
Super 5 800k External Drive ..... 325.
Mouse Systems
A+ Optical Mouse ..... 59.
N² Products
Mac to Modem cable *(6 feet)* ..... 19.
Mac to Printer cable *(6 feet)* ..... 19.
Paradise Systems
Mac 10 *(10 megabyte hard disk)* ..... 599.
Mac 20 *(20 megabyte hard disk)* ..... 849.
PBI Software
Switch Box ..... 36.
PKI
Sydewyndr 400k External Drive ..... 225.
McD 800k External Drive ..... 285.
Systems Control
MacGard *(surge protection)* ..... 55.
Thunderware
Thunderscan *(high-resolution digitizer)* 175.
Video 7
MouseStick ..... 39.
Western Automation
DASCH RAMdisk 500k ..... 399.
DASCH RAMdisk 1000k ..... 699.
DASCH RAMdisk 2000k ..... 849.

DISKS

BASF 3½" Disks *(box of 5)* ..... 10.
Sony 3½" Disks *(box of 10)* ..... 20.
Fuji 3½" Disks *(box of 10)* ..... 20.
MAXELL 3½" Disks *(box of 10)* ..... 21.
Memorex 3½" Disks *(box of 10)* ..... 23.
Verbatim 3½" Disks *(box of 10)* ..... 23.
3M 3½" Disks *(box of 10)* ..... 23.
Sony 3½" Double-sided Disks *(10)* .... 30.
MAXELL 3½" Double-sided Disks *(10)* 33.

INFORMATION SERVICES

Compuserve
Compuserve Information Service ..... 27.
Source Telecomputing
The Source *(subscription & manual)* ... 30.

MISCELLANEOUS

Automation Facilities
Floppiclene Drive Care Kit ..... 20.
Floppiclene Drive Care Refill ..... 10.
MacPak Complete Care System ..... 29.
Clean Image Ribbon Co.
Clean Image Ribbon Kit ..... 12.
Computer Coverup
External Disk Drive Cover ..... 4.
Imagewriter (II) Cover ..... 8.
Mac (Plus) & Keyboard *(two covers)* ... 10.
Diversions
Underware Ribbon ..... 9.
ColorPack *(includes Colorpens)* ..... 19.
Environmental Software Company
The Clutch *(holds 8 disks)* ..... 9.
MACATTIRE
High quality rip-stop nylon dust covers.
External Drive Cover *(400k & 800k)* ..... 7.
Numeric Keypad Cover *(fits Turbo Touch)* 7.
Imagewriter (II) Cover 11
Wide Imagewriter Cover 13

Mac (Plus) & Keyboard Cover ..... $15.
Laserwriter Cover ..... 17.
Mac (Plus) & HD20 & Keyboard Cover 18.
I/O Design
Imagewriter Color Transfer Ribbon ..... 10.
Imageware ..... 45.
Imageware II ..... 49.
Imageware wide ..... 49.
Macinware Plus ..... 69.
Innovative Concepts
Flip & File Micro *(holds 25 disks)* ..... 9.
Flip & File *(holds 40 disks)* ..... 18.
Innovative Technologies
The Pocket Pak *(holds 6 disks)* ..... 10.
The Easel *(holds 20 disks)* ..... 14.
The Disk Directory *(holds 32 disks)* .... 21.
Kalmar Designs
Teakwood Roll-top Case *(holds 45 disks)* 14.
Teakwood Roll-top Case *(holds 90 disks)* 21.
Magnum
Mouse Mover *(let your mouse ride!)* .... 14.
Moustrak
Moustrak Pad *(standard 7"x9")* ..... 8.
Moustrak Pad *(large 9"x11")* ..... 9.
Imagewriter Pad ..... 12.
Pacific Wave
Flip Sort Micro *(holds 60 disks)* ..... 15.
Ribbons Unlimited
Imagewriter Color Ribbons ..... 5.
Imagewriter Ribbons Six Pack ..... 27.
Imagewriter Rainbow Six Pack ..... 27.
Smith & Bellows
Mahogany Disk Case, made by New England Craftsman *(Holds 90 disks)* ..... 28.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for charge cards.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- Net accounts pay actual shipping.
- No sales tax.
- All shipments insured; no additional charge.
- Allow 1 week for personal and company checks to clear.
- UPS Next-Day-Air available.
- COD max. $1000. Cash or certified check.
- 120 day limited guarantee on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-7711 Monday thru Friday 9:00 to 5:30.

SHIPPING:

Continental US: For printers and drives add 2% for UPS ground shipping (call for UPS Blue or UPS Next-Day-Air). For all other items, add $2 per order to cover UPS shipping We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. **Hawaii:** For printers and drives, actual UPS Blue charge will be added. For all other items, add $2 per order **Alaska and Outside Continental US:** Call 603/446-7711 for information.

Order out of Chaos

Danny Goodman

With the release of 800K double-sided disk drives, the Hard Disk 20, and Finder 5.1, Apple's new Hierarchical File System lets you organize files in true file folder style. Once you know some of the system's intricacies, you'll have your disk storage firmly under control.

When you are confined to 400K, single-sided drives on the 128K and 512K Macintoshes, you rarely have difficulty organizing application and document files on a disk. On the desktop, you can group files into folders to eliminate visual clutter and help you find your way through several dozen icons. Within an application, the Standard File dialog box (the one you see when you choose Open from the File menu) lists all applicable documents on the disk in convenient alphabetical order, regardless of folder organization. Unfortunately, the more files you store on a disk, the slower the Finder works to track information.

Hard disks by themselves aren't the solution. Early models presented problems because a 10- or 20-megabyte disk could easily store more files than the Finder could track effectively, causing enormous delays in recreating the desktop when you quit an application or in opening a document from the Standard File dialog box. Moreover, an Open File dialog box could conceivably list hundreds of documents.

To counteract the Finder's sluggish performance and organizational nightmare, as well as severe file quantity limitations in Finder version 1.1g, hard disk

developers divided the hard disk into several *volumes*. The Finder was tricked into seeing each volume as if it were a separate disk, and you could hide ("unmount") unneeded volumes from the Finder with the help of a small utility program that worked only from the desktop. The more inactive files you could mask from the Finder, the faster the Finder worked. Although this was a practical stopgap measure, most people hoped that Apple would soon furnish a new Finder that would speedily handle as many files and folders as someone would likely create on a hard disk, and offer quick access to any file from the Standard File dialog box.

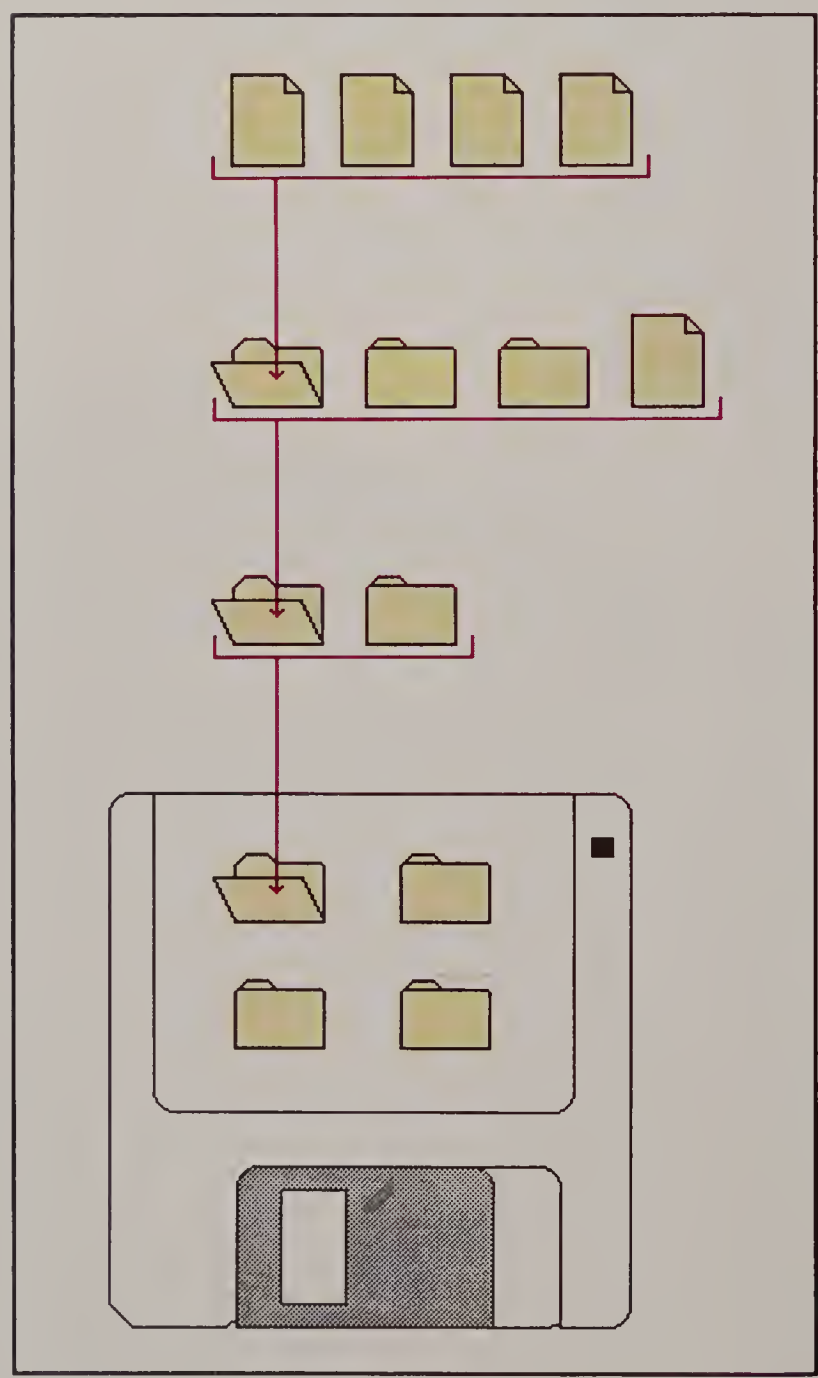


Figure 1
In a hierarchical filing system, documents and folders "nest" inside one another. Folders in Finders 4.1 and earlier were strictly desktop conveniences; in Finder 5.1, documents retain their folder identities, even from inside an application.

Apple's long-awaited solution is called the Hierarchical File System (HFS). It is built into the Mac Plus's read-only memory (ROM). The new ROM comes with the 800K disk drive upgrade for earlier Macs. The latest version of the Finder, release 5.1, recognizes both the HFS and the older, "flat" file structure (release 5.0 does also, but Apple encourages all 5.0 owners to buy the ROM and Finder 5.1 updates from their dealers to get the latest features and refinements). The HFS was designed to handle the large number of files and folders that will likely be generated on a hard disk, such as the Hard Disk 20 (HD 20), and Apple's new 800K double-sided floppy disk drives. With the new ROM, single-sided disks are treated as nonhierarchical system disks, even on 800K drives. Because the old System (2.0) and Finder (4.0) do not recognize the HFS file structure (the HFS files are invisible), make sure you use System 3.1 and Finder 5.1 on your startup disks. You update disks by moving the new System and Finder icons onto your old startup disks or by using the Installer program that comes on the Mac Plus System Tools disk.

Chain of Command

A hierarchy is any group of people or items arranged in a sorted series or in steps, as in a hierarchy of military rank. Generals give orders to their colonels, the colonels in turn pass the orders to their majors, and so on, down the ranks.

In the HFS desktop display and Standard File dialog box, the topmost rank is symbolized by a disk icon: a floppy disk for an 800K disk and a hard disk for the HD 20 or similar hardware. Ranks below the disk directory are represented as folders. Each successively lower rank of folders is "nested" in the rank above it, like slipping papers and manila folders inside progressively fatter folders in a file cabinet drawer (see Figure 1).

Thanks to early Finder versions, you probably already have a feel for file hierarchy at the desktop level if you've placed folders inside one another and then opened folder after folder to find a document icon. These folders, however, are merely cosmetic desktop aids. The Finder really sees the files as one long list, without any folder organization.

What's so important about the HFS, however, is that the Finder recognizes folder divisions and lets you open and close folders from the Standard File dialog box. In other words, whenever the Standard File dialog box is "looking" into a folder, only the names of documents and folders appearing in that folder's desktop window equivalent are listed. Even if a hard disk has 10,000 files stored on it, the Standard File dialog box lists only as many documents or folders as you would see looking at the currently opened folder. That makes finding a specific file on a crowded disk much easier and greatly reduces the amount of time-consuming work that the Finder and the disk drives must do.

Let's say you want to view a file from an extensive folder organization of your financial records (see Figure 2). The document you want to see is a *Microsoft Excel*-based travel expense report for the second week of April. When you open the main disk directory on the desktop, the Financial folder is visible (along with other disk directory folders not shown in Figure 2). To access the file labeled Week 2 from the desktop, you open a series of five folders—Financial, Taxes, Expenses, Travel, and April—to see the weekly document icons.

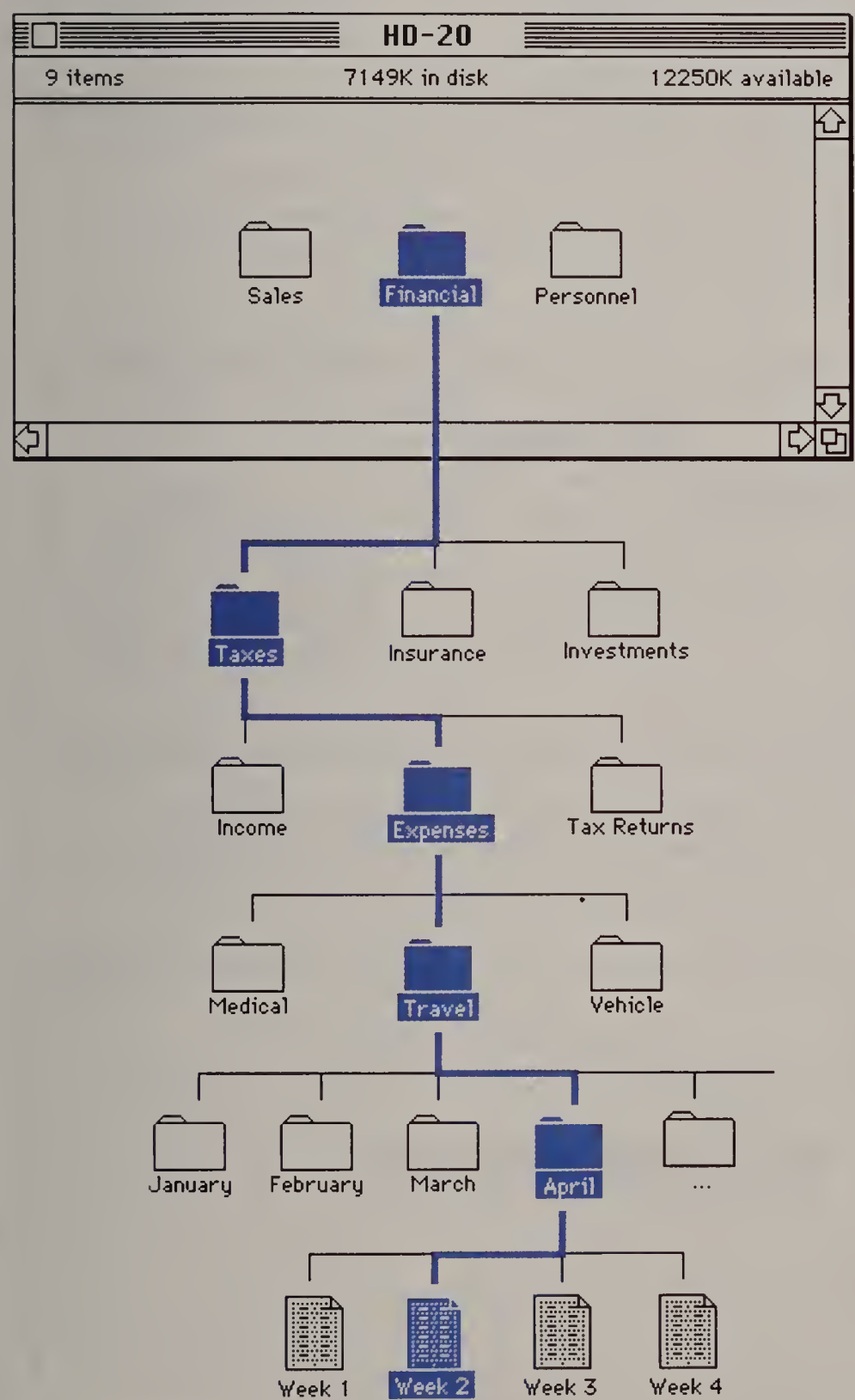


Figure 2
The Macintosh Hierarchical File System establishes nested levels of folders and documents. The Finder keeps track of the pathway through the hierarchy to your document.

You can then double-click on the Week 2 icon to start the application (*Excel*) and automatically open the Week 2 document inside the application. By doing so, you also establish a path to the April folder that the Finder will follow to save changes to the Week 2 document. Also, while the application is open, if you choose Open or Save As from the File menu, you see the HFS version of the Standard File dialog box, which lists all documents in the April folder (see Figure 3).

A major advantage of HFS over other hard disk volume arrangements is that you can make your way to other folders while you view the Standard File dialog box. Simply place the mouse pointer on the current folder name (April in Figure 3) and hold down the mouse button (see Figure 4). You now see the path that the Finder takes from the HD 20 disk directory to reach the weekly documents in the April folder.

To open a document in a folder elsewhere in the hierarchy, you select the appropriate folder name from the list. To view a document in the vehicle expenses folder, for example, you would select the Expenses folder from the list. The Standard File dialog box then displays a list of the three folders nested in the Expenses folder (notice the small folder icons to the left of the folder names): Medical, Travel, and Vehicle (see Figure 5). Double-click the Vehicle folder name to see the documents in that folder.

You can also navigate through HFS using the ⌘, Tab, Enter, and cursor keys. ⌘ with the up arrow takes you to the next level up, and ⌘ with the down arrow takes you down one level, for example.

This type of folder organization is a convenient way to keep unnecessary files out of view when you're concentrating on a particular document or task. If you set up a good organization plan for your programs and documents, you should be able to find a document more quickly by tracing logically nested folder names than by deciphering names from a list of several hundred files. HFS also reduces the burden of devising unique names for similar files (such as all Week 1 files) on a large storage disk, because two documents with the same name can be stored on an HFS disk, provided the files are stored in different folders.

It's Your Default

In planning your work patterns with the HFS, you should be aware that the Finder remembers the pathway established when you start a program or open a document and that the pathway depends on the method you use to start the application. For example, if you double-click an application icon located in the disk directory, then the next time you select Open or

Save As, the root directory is automatically selected and is therefore called the *default directory*. But if instead you start an application by double-clicking a document icon in a nested folder (as in the April travel expenses example), the document's folder becomes the default directory for the Standard File dialog box. Of course, you can change the default directory by selecting a different folder in the Standard File dialog box.

It is also important to understand how the HFS handles an application's requests for further instructions from auxiliary files, such as a help file. Very often during the operation of an application, the program reaches out to the disk for instructions, which may be stored in the program's file, a separate help file, or separate "support files," some of which may not be visible as icons on the desktop (they are the so-called hidden files). Regardless of the current default directory, when the program reaches out, it first looks to the folder (or disk directory) containing the application icon. If the desired file is not there, the program next looks into the folder containing the System and Finder icons—hence Apple's admonition that both the System and the Finder reside in the same folder. Depending on the application, you may run into problems if you are not careful in placing these auxiliary files (see "Potential Problems").

Loading Up with Applications

For most commercial programs, which have a single program file, you can place the application icon anywhere you please, even in a deeply nested folder. Moreover, most programs with single help files let you place the help file inside the folder containing the System and the Finder, so you don't have to clutter your applications' windows with help files (this works only if each help file, as delivered on the publisher's disk, has a unique name, such as Excel.Help).

You may encounter difficulties with programs that rely on hidden files, however. At first you may not even be able to run a program from the hard disk, even though you correctly copied the program's icon from the floppy disk. That's because the hidden files weren't copied. Fortunately, Finder 5.1 lets you copy the complete contents of a floppy disk onto the hard disk. To do so, drag the floppy disk icon to the hard disk icon. The Finder automatically creates a folder on the hard disk with the name of the floppy disk, and all files—visible and hidden—are transferred in one operation. If the contents of a System Folder are copied onto the new hard disk folder, be sure to trash the System, Finder, Imagewriter, Scrapbook, and Clipboard files, since these are already in your hard disk's system. As a shortcut, hold down the Option key while dragging each file into the Trash; this overrides the dialog box that asks if you're sure you want to erase a file.

You may be tempted to create multiple System Folders on the HD 20 to offer different collections of fonts and desk accessories for different applications. While many hard disks from the pre-HFS days allow

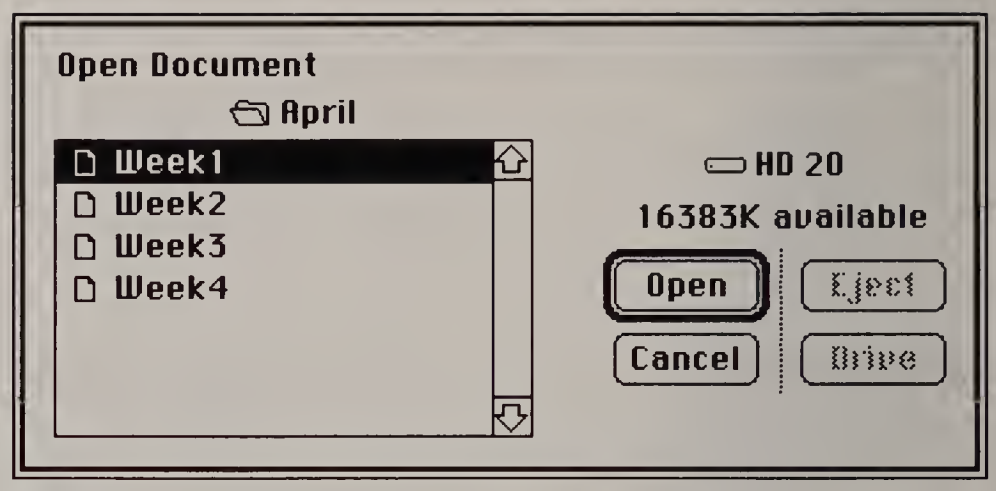


Figure 3
Standard File dialog boxes in the HFS display the contents of only the active folder; its name and small folder icon appear above the scrollable list of documents. Documents in the April folder are listed in the box.

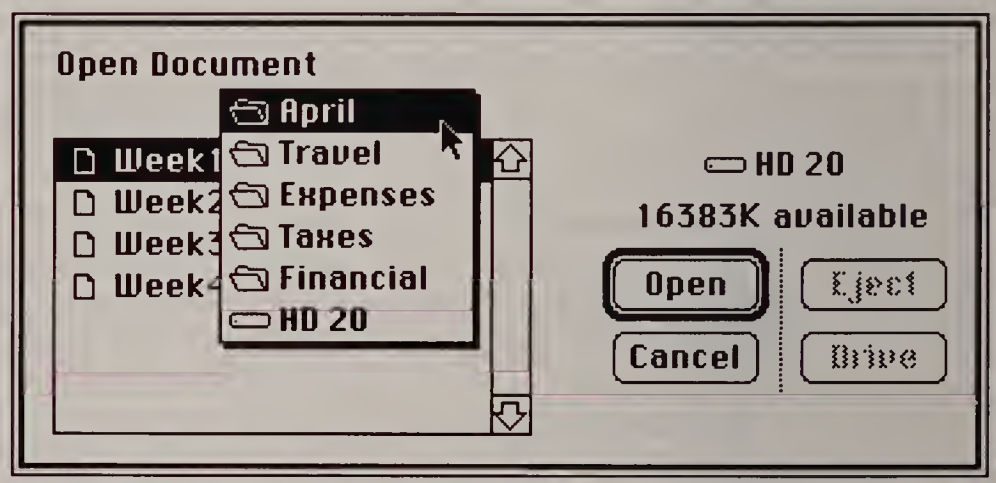


Figure 4
To reach another folder, click on the active folder name and select a folder name further up the hierarchy. Select the HD 20 directory to return to the topmost disk directory.

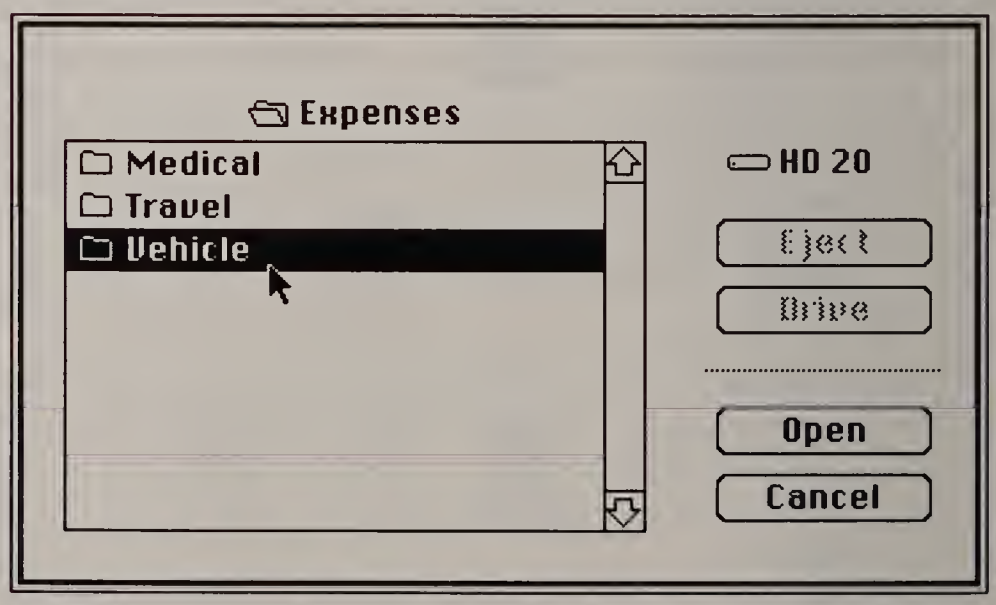


Figure 5
A folder can contain documents or, as shown here, other folders. Small icons tell you at a glance whether a name in the scrollable box refers to a folder or a document.

Potential Problems

Some versions of Mac software purchased prior to January 1986 may have difficulty running with the HFS. Until updated versions appear, be aware of potential incompatibilities and instabilities with the applications in the following list. In some cases (the Infocom games, for example) the problem is related to copy-protection schemes and requires that you use the program from a floppy disk only. Some applications such as *Dollars and Sense* and *Filevision* must be run from 400K floppy disks to read files created with HFS. In many other cases the application works provided that the application and its documents are stored in the same folder. The list is not exhaustive, but it should give you an appreciation for the kinds of problems that you may encounter. Consult with the publisher on the status of updates.

ConcertWare+. Hangs up when you change volume with the Control Panel.

Click-On Worksheet. Bombs with Mac Plus ROM.

Excel. All linked documents must be in the same folder so that references get updated automatically.

Dollars and Sense. Use the floppy disk application only.

Hayden:Speller. Bombs.

MacDraw. The font list does not scroll; it is limited to 11 fonts.

Macintosh Pascal. Cannot copy to 800K drive or hard disk due to copy protection. New key-disk-protected version expected.

MockWrite and Sidekick's Note-pad+. Cannot save files.

MusicWorks 1.0. Use the floppy disk application only.

Red Ryder 6.2. Cannot send or receive files.

Sargon III. Use the floppy disk application only.

Smartcom II. Earlier versions cannot access folders.

Switcher 4.4. Add about 20K per application. All Switcher Set applications must be in the same folder. A new, intelligent version is expected soon.

ThinkTank 1.1. Version 1.1 cannot access folders and is occasionally unstable. Version 1.2 runs correctly.

TurboCharger. Bombs, but Mac Plus ROM contains built-in cache memory.

this (with careful naming and renaming of System files to change systems), the HD 20 and HFS aren't as accommodating. Keeping two System files in different folders can cause errors, so play it safe: keep only one System file on your HD 20.

Organizing Applications

With HFS and a hard disk offering so many possibilities for organizing a number of applications, it is likely that no two Mac owners will have identical setups. But there are some general strategies that you can use as starting points in establishing your system.

If almost all your work revolves around four applications or fewer, consider keeping your Mac desktop free of clutter by dragging those applications from the disk window onto the desktop itself. Then close the hard disk window, leaving only the hard disk, Trash, and application icons showing on the gray background. In Figure 6, for example, the four applications are *Excel, MacWrite, MacDraw,* and *MacTerminal*. The icon for *MacTerminal* is actually one of the program's documents, which contains communications settings for CompuServe at 300 bps. The icon for the *MacTerminal* program is in the HD 20's disk directory, or it can be in a nested folder. To use this arrangement most effectively, it is important to resize the disk window so that the two rightmost columns of icons on the desktop are still visible when the window is open. Leave space along the right edge of the screen for floppy disk icons below the HD 20 icon.

Further supporting this desktop icon arrangement is a feature of Finder 5.1 that lets you open windows without having the windows "remembered" by the Finder. If you hold down the Option key while double-clicking disk and folder icons, the windows open—to show a document icon, for example. Then if you double-click the document icon and start the program, the windows are forgotten. When you quit the program and return to the desktop, all windows will have been closed, speeding up the return to the desktop. (With the 128K ROM, setting the cache memory in the Control Panel to 64K or 128K also speeds up your return to the desktop.) For some users, this layout of frequently used program icons is more flexible than the MiniFinder, despite the latter's speed advantage, because you also have quick access to folder windows and document icons.

Application icons can also be grouped within nested folders inside the HD 20 disk window for a more conventional layout. One alternative is to group several applications in a task-oriented folder according to your typical work flow. For example, if you frequently shift *Excel* spreadsheets and graphics into *Microsoft Word* weekly reports and then send those documents to another Macintosh via modem with *MacTerminal,* you might place all three application icons in one folder labeled Weekly Reports. Other possibilities include grouping applications that you use together, such as for graphics (*MacPaint, MacDraw, MacDraft*), music (*ConcertWare+, MusicWorks*), writing (word processor, spelling checker, outliner), or programming (language compilers and utilities).

Even without an HD 20, the 800K disks offer room to create task-oriented application disks.

In some cases it may be convenient to have more than one copy of a program on the hard disk—for example, *MacDraw* in both a graphics folder and a presentations folder. For another methodology of grouping applications under nested MiniFinders, see "A Hierarchy and 20 Megabytes," *Macworld,* January 1986.

If your hard disk computing experience includes an MS-DOS or similar computer with a tree-structured directory system, you may try to organize your applications by placing each one in a separate folder and then nesting folders for each program's documents. You would end up with folders for *MacWrite, MacPaint, Omnis 3,* and so on. This procedure is like putting kitchen silverware into four drawers—one drawer each for knives, forks, teaspoons, and tablespoons. Bringing together the requisite pieces for a table setting becomes a cumbersome task. Although the one-program, one-directory layout makes sense in the IBM PC world, in which few applications can share data, it is largely unproductive in the HFS.

Even if you don't have an HD 20, the 800K disks offer plenty of room to create task-oriented application disks, just like the previously mentioned task-oriented application folders on the HD 20. For example, you might group *MacWrite, MacPaint, MacDraw,* and the LaserWriter System on one disk dedicated to creating text-and-graphics documents, then group *MacWrite,* a spelling checker, an outline program, and an Imagewriter System on a disk dedicated to word processing drafts.

Organizing Documents

Although applications and their support files may require special attention to placement in the HFS, documents can usually be placed anywhere (see "Potential Problems" for possible exceptions). The danger of this flexibility lies not with the HFS but with the person constructing the hierarchy of files and folders. You will probably be torn between two mutually exclusive desires: to keep folder nesting to a minimum and to keep the number of documents per folder to a minimum.

If you nest folders too deeply—the HFS can easily nest more than 50 levels deep—you spend too much time digging through the hierarchy for the folder holding a given document. This is particularly true as long as there is no global search utility program that can find a file name anywhere on the disk (third-party developers are surely working on such a creature). Five or six documents per folder plus one or two folders is currently the most comfortable number, because you can look at the entire contents of a folder inside a Standard File dialog box without scrolling the listing inside the box.

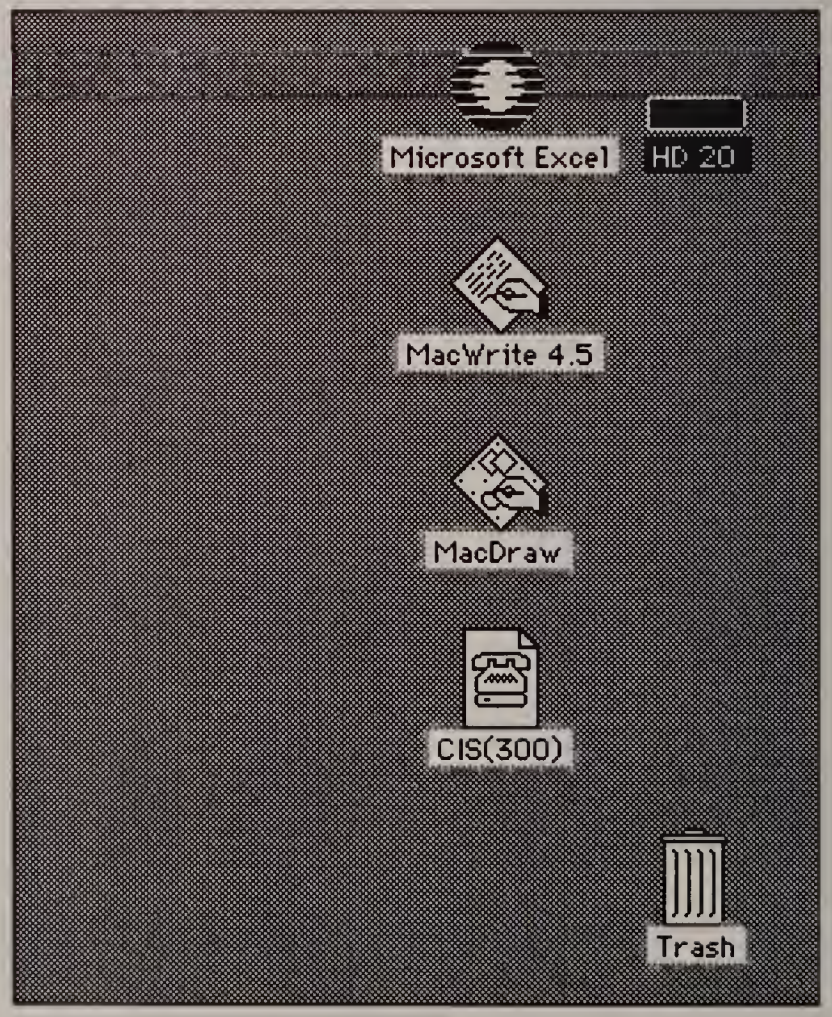


Figure 6
When all your Mac work revolves around a few heavily used applications, you can place those programs' icons on the desktop to keep the desktop clutter-free. Unlike with the MiniFinder, you can still open the disk window to access document icons directly.

To establish a document organization strategy, you have to examine carefully the way you normally work with documents. The method you choose for the HFS may be different from the flat file system you're accustomed to (Finder 4.1 and earlier).

One strategy is to create a folder in the root directory for each major project you work on. Inside that folder could be folders for components of the project. If you are producing an annual report, for example, the folder in the disk directory might be labeled Annual Report. Inside that folder would be folders labeled Scheduling, Text, Graphics, and Budget. Inside Scheduling would be a *MacProject* production schedule document and perhaps a database document for tracking photographs to be taken for the report. Inside the Text folder are two more folders: Words and Numbers, which contain the text and financial figures documents, respectively. The Graphics folder contains *MacDraw* and *MacPaint* documents, while the Budget folder contains a single *Excel* document for the project's budget.

When you finish a work session, copy the entire folder to a floppy disk (or to a second hard disk or tape drive if you are so equipped) as a backup of the day's changes. If the folder is larger than the floppy disk (either 400K or 800K, depending on your Mac's configuration), open the project folder and divide the backup operation into as many pieces as you need by copying some of the nested folders to one floppy disk. To determine the size of a folder in Finder 5.1, you select the folder icon on the desktop and choose Get Info from the File menu.

To help keep the disk directory clutter-free, place folders of completed projects inside another top-level folder labeled Archives. The disk directory then predominantly displays folders of active projects.

Another solution, for a different work pattern, is to create disk-level folders for each client, customer, or department for which you do work. A writer, for example, might keep folders in the root directory for each publication. Inside one of those folders would be a folder devoted to each project for that publication, and inside a project folder might be further folders for correspondence, text, graphics, and so on. Fortunately, each project folder can have nested folders with the same names for the sake of consistency across the entire disk.

The two methods just described mesh well with a Macintosh user's propensity to combine several applications for one project or task. If your organizational needs are more unidimensional, you can establish disk directory folders for each document type: reports, correspondence, budgets, databases, and so on. From there you can create alphabetical folders just like the tabs on hanging file folders.

If you generate tons of documents, you can literally create 26 folders inside the correspondence folder, one for each letter of the alphabet. When you're ready to file a letter, you just issue the Save As command from your word processor and use the HFS Standard File dialog box to open the desired folder from the alphabetical listing (see Figure 7). It's just like thumbing through a filing cabinet and dropping the paper into the appropriate folder.

With so many different ways to work with the Mac and with so many possibilities offered by the HFS, new methodologies and organizational systems will abound for a long time to come. Be on the lookout for tips from *Macworld* and Macintosh user groups. □

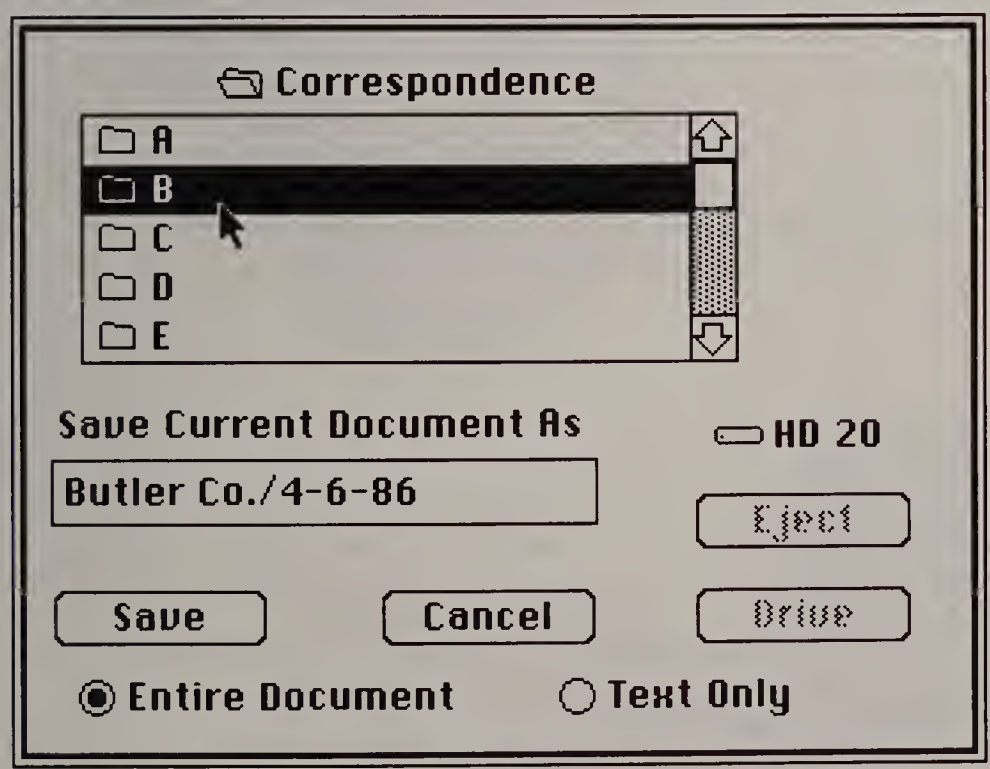


Figure 7
In an extreme case of high-volume filing, you can create storage folders for each letter of the alphabet. In this example a letter to the Butler Company is about to be saved into the B folder inside the Correspondence folder.

Danny Goodman is a Contributing Editor of Macworld *and the author of* Hands-On Excel *(Scott, Foresman & Co., 1985).*

Finder 5.1
Hard Disk 20
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
408/996-1010

New Relations

Jim Heid

Database management is one area of software with a proliferation of programs for the Macintosh. At least a dozen programs are already available, and more are in the offing. They range from simple file managers to fully relational databases. This review focuses on three new relational database managers that have some of the advanced features required by businesses.

Although any database manager can store and retrieve information, businesses require programs that can handle tasks such as client tracking and billing, inventory control, and accounting–applications that are too demanding for most file managers. What's more, businesses often need special features such as password protection to help guard sensitive data, entry checking to help uncover errors as they're made, and mail merge commands that combine text with stored data to produce "personal" form letters.

Interlace, MacBase, and *Omnis 3* are designed to meet the demanding data management needs of businesses. All three programs are relational data managers, which means they can link separate data files to create a database containing information from both. With them you can store customers' names and addresses in one file, for example, a list of their orders in another, and the prices of items ordered in a third. At billing time, a relational database manager can extract data from all three files to print an addressed invoice for each customer.

Businesses that have complex printing requirements need a program that facilitates easy report design, with full access to the Mac's fonts and the ability to work with the LaserWriter. And although it doesn't affect the product's ability to do the job, a well-designed program should let you move items by dragging them and let you produce reports without repeated trial-and-error position adjustments.

Whether you need these features depends on your work. The following reviews zero in on the applications and work styles for which each product is best suited. The vital statistics of the programs and those of a few other database management programs are shown in the table "Databases at a Glance." In addition to the three programs reviewed here, a few other database managers meet the requirements of business (see "Data That Means Business," *Macworld,* August 1985).

Interlace

One reason people use spreadsheet programs such as *Jazz* and *Microsoft Excel* for database management is that their many built-in functions let you analyze data instead of simply storing it. Financial, arithmetic, and trigonometric functions for solving business and engineering problems have traditionally been the domain of spreadsheet programs. Most database managers can perform simple math as well as calculate totals and averages in reports, but they can't calculate sines and cosines, determine net present values, or add and subtract date values.

Singular Software calls *Interlace* "a database manager with a spreadsheet on its mind." From a calculating standpoint, that billing is accurate. With 49 arithmetic, text, and statistical functions–almost as many as *Microsoft Multiplan* provides–*Interlace* can handle business and engineering calculations that would stump most data managers. If you use a spreadsheet program to manage data but find its filing and

reporting skills limited, *Interlace* presents an appealing alternative. If your reporting needs don't involve complex calculations, *Interlace* is still worth considering, although it does have some limitations that warrant scrutiny.

Getting an Overview

You create an *Interlace* database in the Overview window, which shows the structure of database files and remains on the screen while you use *Interlace*. Using the Overview window, you add new fields and specify the kind of data they hold. *Interlace* provides fields for storing text, numbers, and other types of data, but it doesn't provide a calculated field type—a curious omission for a program that purportedly has arithmetic prowess.

The Overview window also lets you specify relations between files by creating a special link field in each file and dragging the link field of one file to that of another. *Interlace* depicts links graphically by drawing lines between linked files (see Figure 1). With most data managers—especially ones for the IBM PC—linking files is a difficult hurdle that newcomers face. By making the abstract concept of file linking a concrete, visual process, *Interlace* simplifies the process of creating multiple-file databases.

Unlike most Mac database managers, *Interlace* can access up to 15 files simultaneously and provides a Window menu for switching between them. They can be files linked to form a complete database, unrelated files that you want convenient access to, or a combination of linked and separate files. The ability to open numerous files and reports, whether they're related or not, increases *Interlace*'s flexibility. It is a good choice for people who make frequent use of two or more databases in the course of their work day.

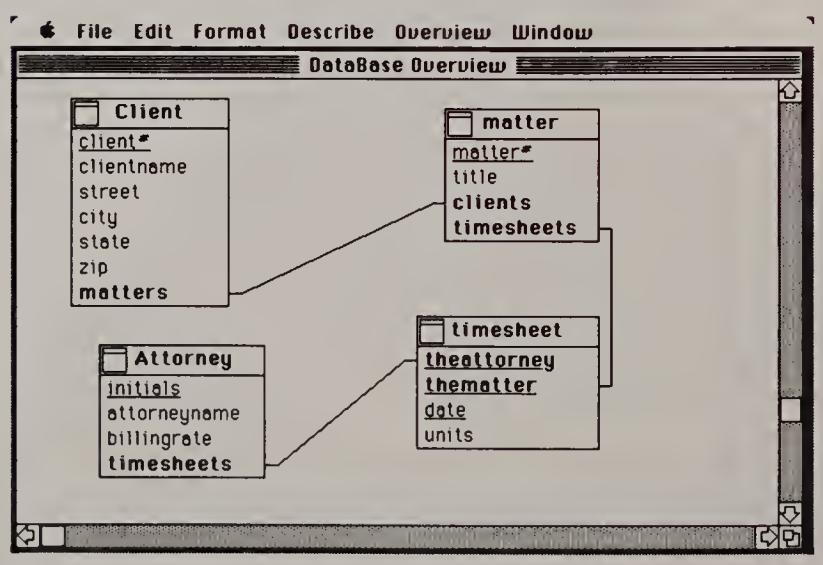


Figure 1
With Interlace, *you specify relations between files by creating a special link field in each file and dragging the link field of one file into that of another.* Interlace *depicts the links with lines between linked files. Here, the Overview window depicts an attorney's client billing database, made up of four linked files. Underlined field names are key fields.* Interlace *uses them to sort data and differentiate records.*

One Thousand Characters

You open a file for data entry by double-clicking on its title bar in the Overview window. *Interlace* automatically creates simple data entry screens—a time-saving feature that lets you start entering data immediately. You can also customize the preset data entry screen by dragging fields into position.

Unfortunately, *Interlace* stores no more than 1002 characters in each record, or less than one screen of single-spaced 12-point text. This amount is adequate for most applications because a typical field is usually less than 30 characters in length. However, if you require long text fields for tasks such as storing paragraphs of research notes or magazine article abstracts, you could easily run into *Interlace*'s space limit. Although it is somewhat inconvenient, you can use the program's relational capability to work around this limitation. First, store most of a database's brief information, such as names, addresses, prices, and amounts, in one file. Then link the file's records to another file that contains corresponding records with one or more large text fields. If you require fields longer than 1002 characters, you should consider a different program.

The Formula Approach

With many database managers, you search for specific records by filling in a screen that mimics the data entry form. But *Interlace* favors the approach of spreadsheetlike formulas. A database window contains a formula panel similar to that of a spreadsheet program. You can either type an entire formula or use the mouse to build formulas. The formula approach lets you use *Interlace*'s many functions to create powerful search specifications. It also makes spreadsheet veterans feel at home with *Interlace*.

If you aren't a spreadsheet veteran, however, becoming proficient with formulas may take time. Formulas are built by pointing and clicking, but they are not edited the same way. If you build a formula to locate all clients in a given state and then decide to further narrow the search to those in a certain city, you have to rebuild the formula from scratch or type in the additional criteria.

Putting Data on the Table

Another reason spreadsheet programs are popular as data managers is that they present data in table form. A table display works like a kind of interactive report. Seeing many records at once gives you an overall picture of a database, but you can also enter new records and edit existing ones, which is a convenience that report displays don't offer. Unlike a spreadsheet, *Interlace* can't display a database in table format. You can design a report to present data in table form, but you can't edit or add to the table displayed on screen. If you can't do without table displays, you might be better served by *OverVUE, Microsoft Excel, Microsoft File,* or perhaps *Jazz*'s database manager.

(continues on page 102)

Databases at a Glance

	Interlace	MacBase	Omnis 3	Double Helix	OverVUE 2.0	Microsoft File
Data Entry, File Management						
Maximum field length	1002	6600	60	32500	62	32767
Maximum fields per record[1]	255	unlimited	120	unlimited	64	1023
Maximum records per file	disk	disk	disk	disk	RAM	65535
Field types provided[2]	1, 2, 3, 4, 5, 7	1, 2, 3, 9	1, 2, 3, 5, 7, 8	1, 2, 3, 5, 6, 8	1, 2, 3, 4, 5, 7, 9	1, 2, 3, 6, 8
Relational	yes	yes	yes	yes	yes	no
Entry checking	yes	yes	yes	yes	yes	no
Field presets	no	yes	yes	yes	yes	no
Computed fields per record	none	unlimited	120	unlimited	64	1023
Table view of database records	no	no	no	no	yes	yes
Form design method	free with fonts	free with fonts[3]	free	free with fonts	free	free with fonts
On-screen rulers for form design	no	no	no	yes	no	yes
Custom pull-down menus	no	no	yes	yes	yes	no
Custom dialog boxes	no	no	yes	no	no	no
Password protection	no	no	yes	yes	no	no
Run-time version available	no	no	yes	yes	no	no
Multiuser version available	no	no	yes	yes	no	no
Report Generation						
Maximum sorting levels	unlimited[4]	unlimited	9	126	unlimited[4]	10
Computed fields in reports	yes	yes	yes	yes	no	no
Report destinations (screen, printer, disk file)	S, P, D	S, P	S, P, D	S, P	P	S, P
Headers	yes	yes	yes	yes	yes	yes
Footers	yes	yes	no	yes	yes	yes
Print quality (draft, standard, high)	D, S, H	D, S, H	D, S, H	D, S, H	D	D, S, H

[1] Unlimited. The database manager imposes no practical limit on the number of fields a record can contain; a record can have as many fields as will fit on a form.

[2] Field types:

1. text
2. number
3. date
4. time
5. logical (yes/no)
6. picture
7. sequence
8. calculated
9. telephone number

[3] 12-point text only

[4] Sorts on one field at a time but allows sorts on consecutive fields while it maintains the previous sort order.

Databases at a Glance

The table compares the capabilities of the database managers evaluated in this review. Three other database managers are included for comparison. Double Helix *features listed here are based on prerelease information from the developer.*

(continued from page 100)

Interlace offers two ways to print reports. When a data entry window is active, the Print command prints the currently displayed record according to the data entry screen's layout. Alternatively, you can create reports that print all or selected records in table form, or in any format you design. *Interlace*'s battery of functions and its ability to combine data from many files into a single report let you create complex reports, such as a complete 1040 tax form. For printing on preprinted forms such as invoices or insurance forms, however, *Interlace* lacks a measuring system for precisely positioning report elements. Positioning elements to print in the right place requires patience and experimentation.

Overall, *Interlace* is a decent program. Its assets are the Overview window, which simplifies linking files; its built-in functions, which allow reports to contain complex analyses of data; and its ability to open many files at once, which gives you fast and convenient access to more than one database or report. Its failings are its 1K per record data storage limit and its lack of calculated fields and a measuring system for precisely positioning form and report elements. Whether its reliance on formulas is a plus or a minus for you depends on your familiarity with spreadsheet programs. If you aren't used to working with formulas, or if your application requires calculated fields, *MacBase* might have more appeal.

MacBase

MacBase from Eqtron is another relational database manager that provides a wide range of arithmetic and text functions. While *Interlace* and its Overview window stress the structure behind databases, *MacBase* takes a forms-oriented approach. Instead of creating a file's structure in one window, its data entry screen in another, and its report in still another, you work with all aspects of a database in one window. To create a database, you design a form: you type field names, specify their characteristics, drag them into position, and then start entering data. For reporting, either you print records according to your form's design, or you design another form and merge the records into it.

In theory, the forms concept makes setting up databases easier for data management novices by insulating them from the underlying structure of files. In practice, *MacBase* has some rough edges that make creating a field time-consuming and limit *MacBase*'s ability to work with visually complex forms. It's a capable data manager with some good qualities, but its form design features are not among them.

Design Drawbacks

Having full control over the appearance of data entry screens is important when you want screens to mimic paper forms. Similarly, some applications, such as invoice printing, demand that you be able to position items accurately. For a program that stresses the forms concept, *MacBase* lacks design flexibility. There's no measuring system for precise positioning. The program seems to fight when you try to position items carefully. For example, I couldn't align the right sides of field labels located one above the other.

You can use any Mac font in a *MacBase* form, but only in the 12-point size. You can paste graphics and text in other sizes from *MacPaint* (Hayden's *Art Grabber* desk accessory is included to simplify the task), but *MacPaint* text looks lighter than characters stored as text and printed on the Imagewriter in high quality.

MacBase's form design features often create unnecessary work. Fields and their labels are produced separately. Everything you type is a label until you use a tool palette to turn certain labels into fields (see Figure 2). Unlike *Interlace, MacBase* doesn't save you time letting you use each field name as a label. Like *Interlace, MacBase* also fails to provide a marquee for selecting and moving or formatting many items at once. In fact, multiple items can't even be selected by shift-clicking.

Forms within Forms

Fortunately, *MacBase* is a better database manager than a form designer. Unlike *Interlace, MacBase* has calculated fields with formulas that you edit with the mouse.

You set up relational databases with *MacBase* by designing forms within other forms in a kind of box-within-a-box approach. Forms that are related to other forms contain a small form icon. Double-clicking on the icon causes the related form to zoom into view. Although Eqtron claims that you can nest forms to a depth of over 200, 3 or 4 levels are sufficient for most applications. More than 4 nesting levels are inconvenient, because *MacBase* lacks a window menu for switching between forms; locating a specific form when several are open simultaneously requires some window shuffling.

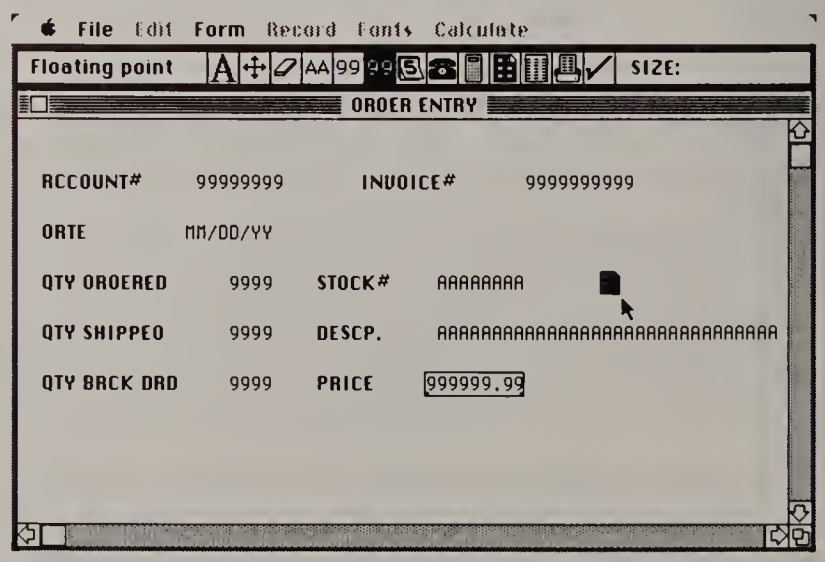


Figure 2
With MacBase *you create fields and the labels that appear next to them separately. Each icon in the palette represents a different field type or form design function. Here, the pointer indicates the icon for a related form, which zooms into view when you double-click on its icon.*

For large databases involving frequent, lengthy data entry sessions, *MacBase* can seem ploddingly slow. *MacBase* treats all fields as key fields and sorts a record on all fields as soon as you enter it. The larger the database, the longer it takes *MacBase* to enter a single record—as long as 40 seconds for a database having 1000 records. *MacBase* performs especially slowly on floppy disk systems when numerous forms are open. Even with a hard disk, entering new records requires patience.

Fortunately, searches are swift, no matter what field you search on. *MacBase* is better for personnel or client databases that require frequent searching, but only occasional data entry, than it is for maintaining a mailing list or magazine subscriber database, which involves extensive data entry but fewer searches.

Forming Searches and Reports

You search for specific records by filling out a data entry form and typing what you're looking for in the appropriate fields. This approach is more straightforward than *Interlace*'s formula approach, but it's not flexible. *MacBase* doesn't permit AND and OR operators within a field (as in "find all employees in marketing AND sales"—an easy trick for an *Interlace* search formula). Similarly, *Interlace* can locate in one step all employees who earn more than $20,000 but less than $30,000. With *MacBase,* it's a two-step process: first you search for employees who earn more than $20,000; then in a second step you search for those who earn less than $30,000.

True to its forms nature, *MacBase* lacks a separate command for creating reports. To print records in a format other than the data entry screen's, you design another form and merge it with the first form, thereby giving the second form permission to access the records available to the first. To create table-style reports, you design a form containing a *list area.* List areas combine with *MacBase*'s more than 40 functions to let you produce detailed analyses of data, though under the same graphic restrictions as other *MacBase* forms—12-point text only and no measuring guidelines for printing on preprinted forms. Like *Interlace, MacBase* doesn't provide an option to view and edit a database in table form.

MacBase makes a good alternative if you need calculated fields or if *Interlace*'s reliance on formulas bothers you. But while they both have roughly the same calculating talents, *MacBase* lacks *Interlace*'s flexibility. You can't work with related and separate data files on the screen simultaneously, and I found *MacBase*'s related forms more cumbersome to work with than files linked with *Interlace*'s Overview window. *MacBase* and *Interlace* can both manage databases composed of two or three related forms or files, but *Interlace* is the better program for applications involving many linked files and long sessions of entering and searching for data. It's more responsive than *MacBase,* and it allows more complex searches.

Users of Apple's Hierarchical Filing System (HFS) should also be aware that version 1.0 of *MacBase* doesn't work properly under the HFS. The version's Merge command, which allows a form to access records stored by other forms, doesn't work; in fact, it causes the system to crash. An Eqtron representative says that the firm is aware of the problem and is developing a version that will work properly under the HFS.

Omnis 3

As powerful as *MacBase* and *Interlace* are, neither is an *application generator*—a database manager that lets you create your own menus, dialog boxes, and custom commands to work along with the database. Application generators allow businesses and developers to create data management applications that require no knowledge of the files used or the program itself on the part of people who use the database. For example, the application's designer builds commands into the application for searching and reporting instead of obliging someone to learn how to build a search formula or how to list all clients sorted by state and category.

Of the dozen or so Mac database managers currently available, only Blyth Software's *Omnis 3* lets you generate custom applications that have Macintosh features such as menus and dialog boxes. At press time, Odesta was working on a new version of *Helix,* called *Double Helix,* that offers users the ability to create custom database applications, or turnkey applications, with their own pull-down menus and dialog boxes. Odesta planned to include password protection, improved data transfer, and subforms in *Double Helix. Omnis 3* isn't as easy to use as *MacBase* or *Interlace,* but once you master its programming facility, which lets you create pull-down menus, dialog boxes, and buttons, you can develop complex applications that anyone familiar with *MacWrite* or *MacPaint* can use. And you don't have to learn a programming language to use *Omnis 3*'s power, unlike using application generators for most computers. You use the mouse to create the programs—or sequences, as Blyth calls them—that control an *Omnis 3* data management application.

Lots of Groundwork

Because *Omnis 3* is relatively complex, creating a new database with it requires more time and effort than with *Interlace* or *MacBase.* You can't just create a half-dozen fields and then start entering data. First, you have to create a library file, which stores a database's design—its file structures, data entry screens, menus and programming statements, and report layouts. The library file holds only a database's design; the records themselves are stored separately. This separation of design and data shows *Omnis 3*'s application-generating bent. A company with numerous branch offices can develop a single library that each office can then use to create separate databases.

As with *Interlace,* the first step in creating a database is defining the structure of its files. *Omnis 3* provides all the field types required for demanding applications, but it limits text fields to a maximum of 60 characters, making *Omnis 3* unsuitable for text-intensive applications such as magazine or book abstracts.

After designing a database's files, you create its data entry screens. Unlike *Interlace, Omnis 3* provides no preset screen layouts; you have to design every screen from scratch. More significantly, *Omnis 3* provides its data management power at the price of aesthetics. Fields and other text can appear anywhere on a data entry screen, but only in 12-point Monaco or Chicago. And you position screen elements not by clicking and dragging, but by typing or removing spaces and carriage returns.

Omnis 3 has a password protection system that selectively restricts access to the features controlling file and report design. You can grant some users access to *Omnis 3*'s report design features, while keeping them from altering an application's file structures and data entry screens. Other users can be given permission to alter screens and reports at will but be kept from changing custom menus. Still others can have complete access to an application. The flexibility of *Omnis 3*'s protection scheme lets you tailor access to an application to the company or department that will be using it.

Turning the Key

Because a turnkey database application may be used by people who have little database experience, an application generator must provide data entry features that guard against typing errors and invalid entries. *Omnis 3* meets that need well. You can help ensure accurate databases by having *Omnis 3* compare entries against acceptable values that you supply when you create the data entry screen. You can specify preset field contents to reduce repetitive typing. You can also designate fields as "delete protected," which causes *Omnis 3* to allow a record's deletion only if its protected fields are blank or zero. Delete-protected fields are helpful for billing applications in which you wouldn't want an entry to be deleted until the account was paid.

Omnis 3 provides Next and Prev commands for browsing through a database and provides two ways to locate specific data. Click the Find button that appears on the right side of a data entry screen, and you can search for records on any indexed field. A far more powerful searching facility is provided by *Omnis 3*'s search formats, which let you search all fields for up to 50 criteria. You can save any number of completed search formats on disk and recall them when needed. This feature makes *Omnis 3* ideal for applications that involve frequent searches using different sets of criteria.

Omnis 3's reporting facilities are adequate for generating the tabular reports that most businesses need, although the program lacks many of the arithmetic, financial, and statistical functions found in *Interlace* and *MacBase.* And as with *Omnis 3*'s data entry screens, designing reports isn't as simple as click and drag. To move an element, you select it, cut it to the Clipboard, and then click at its destination and paste.

Tying Everything Together

After creating a database's files and data entry screens, you can work with data and design reports without touching any of *Omnis 3*'s programming features. Using *Omnis 3* in this way, however, is like trying to ski while wearing a spacesuit: the bulky surroundings keep you from maneuvering quickly and smoothly. *Omnis 3*'s power is more accessible—especially if you are a database beginner—when you or the programmer tie its filing, searching, and reporting talents together with programming sequences.

Omnis 3's sequences are similar to computer programs (see Figure 3). Its programming-language-like looping structures (REPEAT and UNTIL), conditional tests (IF and ELSE), and branching statements (GOTO and CALL) work together to control a database application. A typical sequence contains the commands for a pull-down menu along with the activities that *Omnis 3* is to perform when a command is chosen—displaying a different data entry screen, invoking a saved search format, or printing a report.

Unlike a programming language, however, *Omnis 3* doesn't require you to memorize syntax and laboriously type sequences. You create them by pointing and clicking with the mouse, thus eliminating the chances of bugs caused by a misspelled command or missing punctuation. It's important to remember, how-

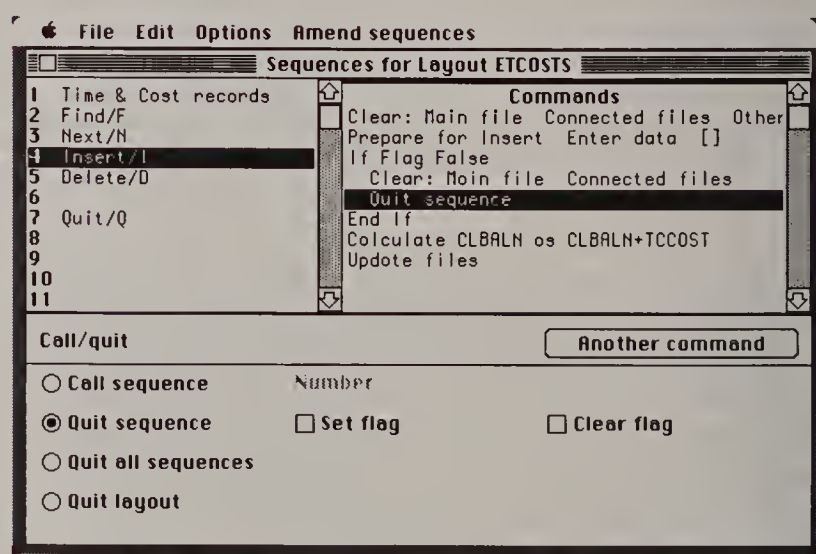


Figure 3

What Omnis 3 *sacrifices in aesthetics, it makes up for in power. Here, a sequence is being created for a custom menu. The numbered list in the upper-left corner appears on the menu, with keyboard shortcuts. The text on the right spells out the steps that* Omnis 3 *takes when you use the Insert command.* Omnis 3 *doesn't require you to type sequence listings; you click to select sequence commands and statements from the choices in the command area at the bottom of the screen.*

ever, that creating sequences is still programming. *Omnis 3* can't prevent you from making a typing error in a calculation formula, such as making a salesperson's commission 100 percent instead of 10 percent. Plan to test sequences thoroughly before entrusting data to them.

Tests of *Omnis 3* with Apple's HFS revealed a minor annoyance: the program cannot find related files unless they are stored on the top level of a disk's directory. At this writing, a new version of *Omnis 3* was being tested. Blyth Software claims that the improved version will work with the HFS and will also provide lengthy text fields with word wrap capabilities as well as other enhancements.

The Best Match

Which database manager is right for your business? *Omnis 3* is best for businesses and developers wanting to create complete applications that exploit the Mac's menus and other user interface elements. Its strengths are extensive password protection, error-checking features, and its sequences, which let you program *Omnis 3* without having to memorize the cryptic syntax of programming languages. Its ability to store search specifications makes *Omnis 3* ideal for applications involving frequent searches using different sets of criteria.

Omnis 3 is not recommended for someone who wants to create files quickly, enter data, and easily search and view it in different ways. The program provides no preset form and report design options, and its complexity demands that you spend time planning and designing databases.

Interlace is a more responsive program and is ideal for complex relational tasks that don't require password protection, calculated fields, or the insulation from a database that *Omnis 3*'s custom menus and sequences provide. *Interlace*'s Overview window provides a painless and effective way to link files, its reliance on spreadsheetlike formulas will help spreadsheet veterans feel at home, and its many functions offer complex analyses of report data.

MacBase is the weakest of the three products tested. The program is worth considering if you need calculated fields and don't mind its lethargic data entry performance and limited form design features, which restrict access to the Mac's fonts and keep you from positioning elements accurately.

MacBase tries to burn the candle at both ends by combining the forms approach of single-file data managers such as *FileMaker* with the relational capabilities of products such as *Interlace*. The end result is an odd candle with a weak flame at both ends. Setting up files requires more work than using single-file products, and you're likely to feel constrained by *MacBase*'s forms-within-forms approach when you set up complex relational applications.

If you're interested in a more successful example of a powerful, forms-oriented database, you should investigate Odesta's *Helix* ("Files of Icons and Tiles," *Macworld*, November 1985) or *Double Helix*. *Double Helix* overcomes some of the problems of nested forms by letting you create a menu that lists the forms you've created.

The best way to determine which database manager is best for you is to examine the way you currently manage data and assess how you want to analyze and report on it in the future. Unless you need some of the advanced features provided by the three database managers reviewed, you will probably be better served by some of the simpler file managers available. File managers help you manage simple databases without the complex features generally associated with relational databases. But if you have more demanding requirements, you should consider *Interlace, MacBase,* or *Omnis 3*. □

Jim Heid is a Contributing Editor of Macworld.

Interlace
Singular Software
5888 Castano Dr.
San Jose, CA 95129
408/446-0207
List price: $95

MacBase
Eqtron Corp.
330 Bay St. #1115
Toronto, Ontario
M5H 2S8 Canada
800/622-2273, 416/361-5002 in Toronto area, 800/387-1555 elsewhere in Canada
List price: $195

Omnis 3
Blyth Software, Inc.
2655 Campus Dr. #150
San Mateo, CA 94403
415/571-0222
List price: single-user version $495, 5-user multiuser version $990, 10-user multiuser version $1785, 20-user multiuser version $2474

Helix, Double Helix
Odesta Corp.
3186 Doolittle Dr.
Northbrook, IL 60062
800/323-5432, 312/498-5615 in Illinois
List price: Helix $395, Double Helix $495, upgrade to Double Helix $180 for registered Helix owners

Cutting Keystrokes

Danny Goodman

The Macintosh was designed to make computers easy to use. Tempo's keystroke- and mouse-maneuver-reducing macros carry the original principle one step further.

Anything gets old with repetition. Saving your work and ejecting your work disk, for example, doesn't really take that long. But after the first few thousand times the routine of pulling down the File menu, selecting Save, waiting, selecting Quit, waiting, and finally selecting Eject and waiting once more for the song of the disk drives to cease can start to feel like your own private purgatory. Deliverance, however, is at hand. Tempo, *a new macro processor from Affinity Microsystems and the most sophisticated macro program yet available for the Mac, lets you perform routine command sequences with a single keystroke.*

Tempo is classified as a *macro processor,* which means that it lets you combine a series of keyboard and mouse commands into a single command known as a macro (see Figure 1). Some application programs, such as *Microsoft Excel* and *SuperCrunch,* have macro programming languages that you can use to fashion lists of instructions that the computer will follow when the macro is invoked. Macro programming languages, however, work only within the program for which they were designed. *Tempo* is a generic macro processor that lets you design a macro that can be used with virtually any combination of applications.

Tempo is also easier to master than a macro programming language, because you don't have to learn a vocabulary of commands and a lot of rules about how to use them. Instead, you create *Tempo* macros simply by going through the mouse and keyboard actions for a sequence of operations. *Tempo* records those actions so they can be replayed later.

A macro is most useful when it automates a routine action that requires a number of steps. For instance, if you regularly extract a database record for inclusion in a word processing document, a *Tempo* macro can open the database program, load the data, present the search dialog box, pause while you type in the selection criteria, extract the data, copy it into the Clipboard, close the database program, open the word processing program, and paste the data into the new document. That entire process could be initiated by pressing a two-key sequence, such as ⌘-E.

If you regularly send a spreadsheet file to the home office by modem, you can design a *Tempo* macro that starts working inside your spreadsheet program to save the file, quits the spreadsheet program, starts your communications program, and waits until 11 p.m. to dial the home office computer and upload the file. Some communications software may even allow the *Tempo* macro to respond to a busy signal indication (sent to the screen by the modem) by waiting a half hour before redialing.

On a simpler level, you can program a *Tempo* macro to perform a pull-down menu operation, or a series of menu operations, with a keyboard equivalent. This ability is particularly helpful if a program that you use has no or few keyboard equivalents for often-used commands (*Mac-*

Write is a good example). In the past, you would have needed Apple's *Resource Editor,* a software developer's tool, to set up keyboard equivalents in programs.

Macro Smarts

Tempo does more than just record user input. A *Tempo* macro can make limited decisions and even trigger other macros if specified conditions are satisfied. The manufacturer calls *Tempo*'s advanced options "intelligent features," but that's somewhat of an overstatement. The program's branch, pause, loop, and launch options elevate it a notch above Assimilation's *Mac Tracks* macro processor, but they are not "intelligent" in the sense of artificial intelligence programming.

Branching is accomplished by comparing the contents of the Clipboard with a predetermined block of text. For example, you could create a macro that would begin by copying the contents of a Totals spreadsheet cell into the Clipboard. If the number in the Clipboard were greater than 9999, the macro could branch to a short macro routine that would reformat the entire spreadsheet to display large numbers with commas, as in 10,109. *Tempo* provides a full range of comparison operations from which to choose (see Figure 2).

Tempo's pause functions can be used in a variety of ways. Programming a pause into a macro allows you to suspend the macro's replay while you enter data, such as the name of a file to be opened or criteria for a database search (see Figure 3). Another pause option lets you add instructional dialog boxes to remind novice macro users what to do next. And you can delay macro execution until a specified time. This feature enables you to program the Mac to communicate, sort a large database, or print on a shared resource such as an office LaserWriter.

Tempo's looping capability lets you set up repetitive operations, either to be performed a specific number of times or until certain conditions are met. For example, a macro you might add to your communications program could combine branch, pause, and loop operations and could instruct your modem to keep redialing a number until it received a connect signal.

Tempo's launching facility is a big improvement over the launching method used in *Mac Tracks* (in Macintosh parlance *launching* means opening an application). *Tempo* lets you specify the name of an application to launch, while *Mac Tracks* primarily replays the precise motions you make when you record a macro. When you double-click on a program icon, for example, *Mac Tracks* simply records the screen coordinates of the pointer and the fact that you double-clicked the mouse. If you rearrange the locations of icons in that window or move the window around the desktop, *Mac Tracks* positions the pointer in the original screen position—which won't open the program and may do some inadvertent damage.

Macro Construction

Planning is important when creating *Tempo* macros. The manual rightly encourages you to break macros into many small modules. You can then use the modules to assemble larger macros, linking the modules by looping or unconditional branching (conditional branches cannot be used to link macros).

Before specifying a branch instruction, you must have already created the macro to which the first macro branches. In other words, you design and create levels of macros from the inside out. This is not necessarily a technique you'll pick up immediately, but you'll appreciate its importance after you program your first multiple-module macro (see "A MacTerminal Dialing Directory Macro").

One of *Tempo*'s most intriguing options, Real Time, enables you to create presentations similar to the Macintosh guided tours. When recording in Real Time, *Tempo* makes a literal recording of every mouse movement, including hesitations and speedups. On replay, you'd swear someone was playing with a second mouse under your desk.

Macro-intensive programs like *Excel* can also use *Tempo*. *Tempo*'s ability to cross application lines complements *Excel*'s macro language. You can also place macros into a Set Startup icon that will run those macros whenever the Mac starts with the disk—a convenient way to do daily file maintenance.

Compatibility

Virtually any program that takes control of the Mac while other applications run is destined to encounter compatibility problems on the first release. *Tempo* is no exception to this unfortunate rule. Following is a list of the incompatibilities I discovered:

AppleTalk. Tempo runs fine with a Mac-to-LaserWriter AppleTalk installation, but not when AppleTalk is configured as a local area network.

Hard Disk 20. The Apple hard disk presents no problems except when the Mac is connected to AppleTalk.

Jazz. Spurious characters appear in the menu bar when you quit *Jazz,* but they have no deleterious effect on your files. This happens in *MacDraw* and a few other common applications.

Microsoft Word. Tempo zips right over seven of *Word*'s dialog boxes before you can make your selections. When this happens, record the macro in Real Time.

OverVUE 2.0. The *OverVUE* screen does not refresh itself after the *Tempo* dialog box closes. Recalling *Tempo* from the Apple menu refreshes the screen.

ReadySetGo 2.0. Manhattan Graphics is reportedly modifying this program to accommodate *Tempo.*

ThinkTank. Risky business.

Switcher. A special case. Version 4.4 is compatible to some extent, but you'll have to allocate up to 15K of additional RAM for each application for *Tempo*'s "overhead." Even then, you won't be able to record a switch between applications (accomplished by either clicking *Switcher*'s dou-

Figure 1
When you finish recording a Tempo *macro, a Save Macro dialog box automatically appears. You assign a name to the macro and, optionally, one of 450 possible keyboard equivalents to start the macro the next time.*

ble-arrow icon or pressing the ⌘-key equivalent). Instead, you'll have to choose Switcher from the Apple menu to return to the *Switcher* screen and then click on the desired application icon. The big hangup with this switch method is that the Clipboard does not convert between applications.

Tempering Tempo

A few words of caution about using *Tempo* are appropriate. First, even though the program installs on a System file as a desk accessory (an installer program is supplied on the disk), it takes up more than 60K on a disk. Not many single-sided application disks have enough space for a 60K accessory unless you delete help files, other accessories, and fonts from the System file. A *Microsoft Word* disk, for instance, comes with 29K available. Deleting the help file, extra printer drivers, and sample document (a total of 45K) leaves scarcely enough disk space for *Tempo* and the file that contains the actual macros (macro files can easily run to 10K or more for active macro users).

If you plan to use *Tempo* macros running across more than one application, you'll have to organize your applications around a single System Folder, creating a startup disk with the System file for the internal drive and an applications disk without a System file for the external drive. You cannot change System files while recording a *Tempo* macro or when *Tempo* is active (when its ⌘-key icon appears in the menu bar).

For example, if you wanted a macro that could copy *MacPaint* graphics into the Clipboard, open *MacWrite,* and paste the graphics, you would create an application disk with only *MacPaint* (70K), *MacWrite* (70K), and the *Tempo* file with pertinent macros (2K to 20K). That would leave 240K or more of disk space free for document storage. For large applications, such as *Jazz* and *Excel,* you'll have to swap systemless application disks in the external drive (while keeping the same system disk in the internal drive) if *Tempo* macros extend across multiple applications—as when linking *MacTerminal* and *Excel* operations, for example.

A Macintosh Plus or a Mac outfitted with internal and external double-sided 800K disk drives offers plenty of space to accommodate *Tempo* and productive groupings of applications.

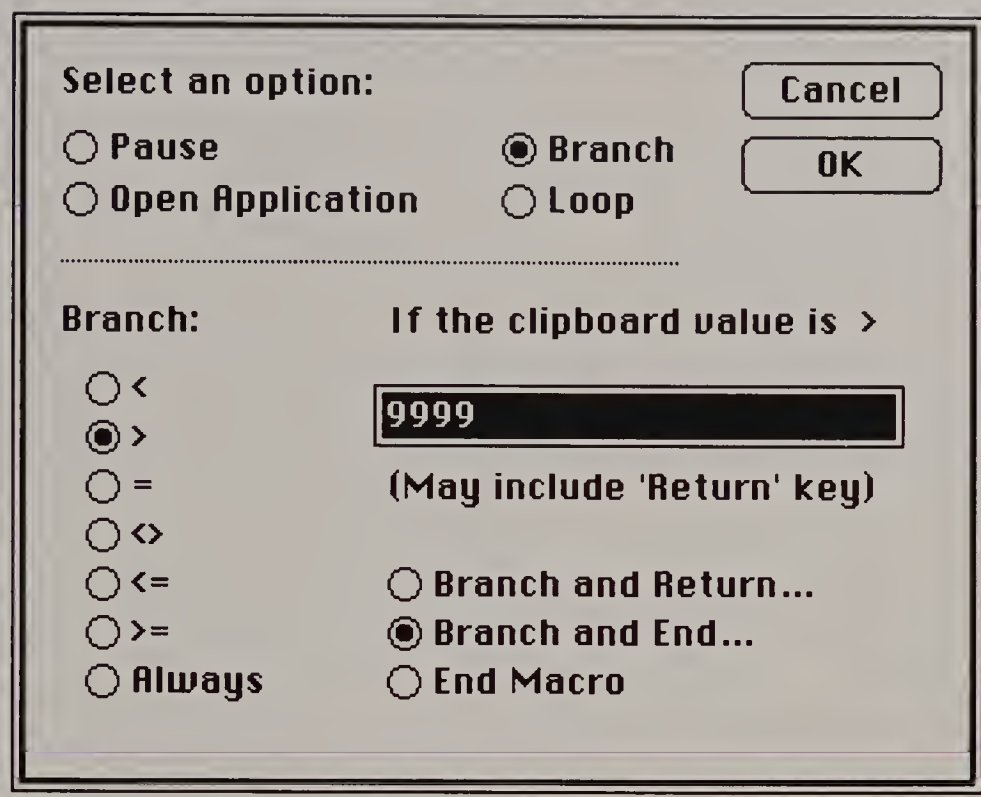


Figure 2
Your macros can test the contents of the Clipboard against predetermined criteria. Depending on the outcome of the test, the macro can branch to another macro module.

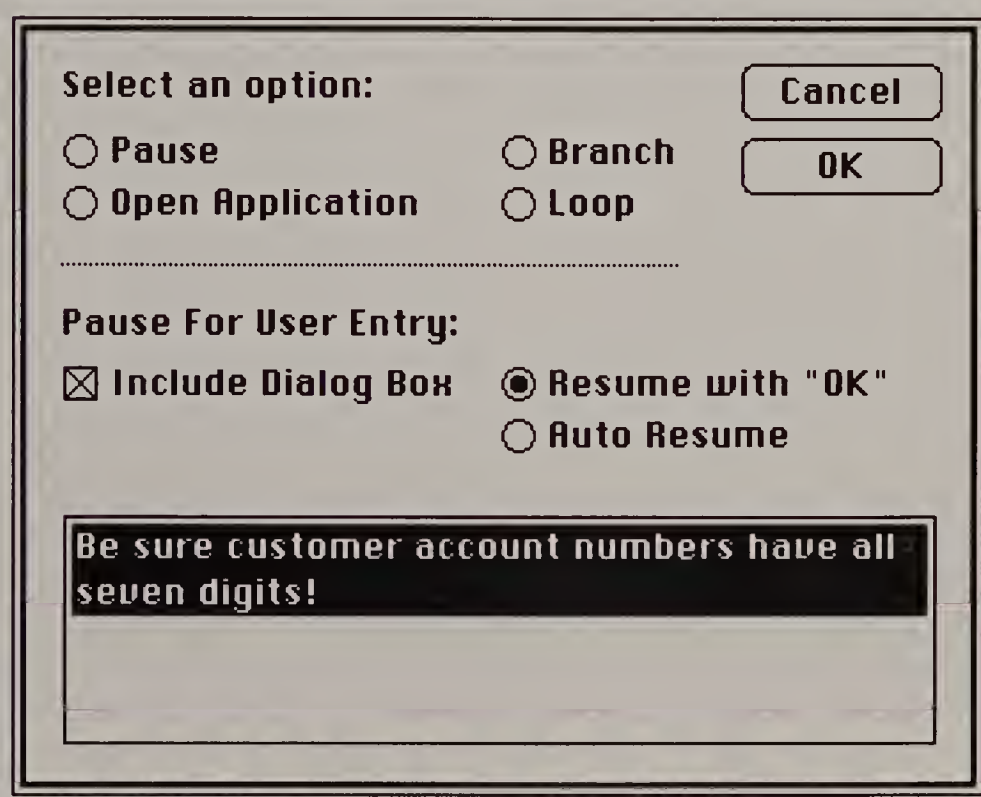


Figure 3
Instructional dialog boxes can be included in a macro. Text for the dialog is typed into Tempo's *Options dialog box while you record the macro.*

Working with Macros

No matter what kind of floppy disk drives you have, get ready to pay close attention to the location of the *Tempo* macro files. You can access only those macros in the "current *Tempo* drive," which you select from a dialog box when you start *Tempo* from the Apple menu. Generally, you would store macros for a particular application on the application's disk, and you would change the current *Tempo* drive when you change applications by quitting *Tempo* and restarting it to change the designated drive.

Although all *Tempo* macros are grouped together into one file labeled Tempo Macros, you can shift individual macros among disks by using *Tempo*'s Import and Export features. Let's say you've created a macro in one application that copies a selected area, opens the Scrapbook from the Apple menu, pastes into the Scrapbook, and then closes the Scrapbook. Because that macro is practical for many applications, you may want to export it from the current *Tempo* drive to other application disks instead of recording it each time for every disk.

If the other disks already have *Tempo* macros, Export adds the new Scrapbook macro to the existing Tempo Macros files; if not, a newly created Tempo Macros file will be added to the other application disks. In contrast, Import lets you bring individual macros into the current *Tempo* drive from other *Tempo* macro files.

A MacTerminal Dialing Directory Macro

MacTerminal doesn't have a dialing directory feature, but you could use *Tempo* to create a macro between *MacTerminal* and a desk accessory such as Macadam's *WindoWare Phone Book*. Since the macro retrieves only a dial-up service's name from the desk accessory, you can use any kind of phone directory desk accessory, as long as it displays the desired name in precisely the same spot on the screen for each entry.

The first step in designing the macro is figuring out what actions the macro should take. The following procedure outlines the actions:

- Close the *MacTerminal* window.
- Open *Phone Book* from the Apple menu.
- Pause the macro so you can page through *Phone Book* for the name of the service to dial.
- Copy the name of the service into the Clipboard.
- Close *Phone Book*.
- Test the contents of the Clipboard against the services usually dialed. If the Clipboard reads "CompuServe 300," for example, branch to a macro module that pulls down *MacTerminal*'s Open menu and selects the *MacTerminal* document (which contains the communications settings and the service's telephone number) for CompuServe at 300 bits per second.
- Pull down the *MacTerminal* Phone menu and select Dial.

You must create a macro for each service, because each one has its own branch module. Assign only a name (no ⌘-key equivalent) for each module, because you probably won't ever need to call these subroutines from the keyboard. Then start recording the major macro section by instructing it to branch to the appropriate module if the test of the Clipboard contents proves true (if Clipboard = CompuServe 300, then BRANCH to CIS 300, and load the *MacTerminal* document with that service's settings). When you finish recording the main macro, assign both a name and a ⌘-key equivalent, such as ⌘-D.

Now, whenever you're in *MacTerminal* and want to dial up another service, such as Dow Jones, press ⌘-D, flip through *Phone Book* for the service number, and watch *Tempo* do all your busywork. You've also given *MacTerminal* a feature it never had before.

WindoWare Phone Book
Macadam Publishing, Inc.
4700 S.W. Macadam Ave.
Portland, OR 97201
800/547-4000, 503/684-3000 in Oregon
List price: $79 (includes WindoWare calendar)

Running *Tempo* on a hard disk in which you have one large Tempo Macros file is the most practical way to use the program. Macros apparently "remember" the application in which they were created. Therefore, you could assign the ⌘-A keyboard equivalent to a macro that chooses Save As from the File menu in *MacPaint* and assign the same keyboard equivalent to a macro in *Word,* even though the Save As option is in a different location in both menus.

Even if you're an extremely energetic macro user, it's unlikely that you'll run out of keyboard commands. *Tempo* provides up to 450 ⌘-key equivalents that use various combinations of the ⌘, Option, Shift, and Caps Lock keys. Of course, it may be counterproductive to generate too long a list of macros that require the simultaneous pressing of enough keys to confound Vladimir Horowitz.

Editing *Tempo* macros presents a potential problem. *Tempo*'s macros are not translated anywhere into a command language you can edit. Editing requires playing back a macro (you can slow down the playback to better see what's happening), suspending playback, and then issuing menu commands to insert a new sequence or delete the last action. You'll find it easier to divide long macros into smaller modules of ten or fewer actions and then reprogram an erroneous module from scratch.

Tempo is priced $70 higher than its nearest competitor, *Mac Tracks.* In light of this discrepancy and the pricing levels of other utility software for the Macintosh and the IBM PC, *Tempo* seems overpriced. Although I recommend a macro processor to every Mac owner, I can't unconditionally recommend *Tempo* over the recently updated *Mac Tracks,* unless you insist on Tempo's branching, launching by name, or Set Startup features and don't mind paying the premium. And don't forget the program's incompatibilities, which could cause problems in certain work environments.

But because of its advanced features and (modest) intelligence, *Tempo* could still become the power user's macro processor, and it just might help you put an end to running your mouse through the same old mazes of complex operations. □

Danny Goodman is a Contributing Editor of Macworld *and the author of* Hands-On Excel, *published by Scott, Foresman & Company (1985).*

Tempo
Affinity Microsystems, Ltd.
1050 Walnut St. #425
Boulder, CO 80302
303/442-4840
List price: $99
Requirements: 128K

BETTER SONY THAN SORRY.

The bomb's up. The system's down. You've lost all your data to disk error because you made a very basic human error. You didn't use Sony floppy disks.

Next time, go with the industry standard, the company who invented the 3.5″ disk drive system, and a floppy disk that comes 100% certified error free. Sony.

Only Sony 3.5″ micro floppy disks contain such error suppressing materials as patented Vivax™ magnetic particles and a high-molecular DDL™ binder system. This protects your micro floppy disk, and the information on it, for its lifetime; and assures data retrieval in the order you choose. Guaranteed.

So use Sony 3.5″ or 5.25″ floppy disks, and avoid disk error. If you use somebody else's, you could be sorry.

SONY®
THE ONE AND ONLY®

© 1986 Sony Corporation of America. Sony is a registered trademark of the Sony Corporation.
Vivax and DDL are trademarks of the Sony Corporation. "The One and Only" is a registered trademark of Sony Corporation of America.

Circle 255 on reader service card

Tools for Thinking

Tom Maremaa and Daniel Farber

In the fifties John McCarthy, inventor of the artificial intelligence programming language LISP, conceived of a new class of software programs. He called these programs "soft robots," or "agents." McCarthy imagined that soft robots would mold themselves to the needs of users, learn their computing habits and quirks, and even act as agents for change. In maintaining a stock portfolio, for example, a soft robot would track the performance of certain stocks, search databases for key financial information, monitor current political and economic factors, and recommend or initiate courses of action. Artificial intelligence (AI) research has not yet developed any commercially available soft robots, but it has given us the next best thing: expert systems.

Expert systems are an attempt to simulate the knowledge of an expert in a particular area, such as medical diagnostics or automotive engineering (see "Experts on Disk," *Macworld,* February 1986). A few expert system development tools have recently been designed for the Macintosh, most notably Neuron Data's *Nexpert,* which is already finding a wide range of applications in the financial, aerospace, and medical fields.

Developed by a group of software engineers from Carnegie-Mellon University, *Nexpert* allows you to create an expert system for the 512K Macintosh or Macintosh Plus without learning a programming language. By AI industry standards, *Nexpert* offers the kind of power and flexibility found in expert-system development tools that cost as much as $80,000, such as Teknowledge's S.1 or Inference's ART. Companies including Hughes Aircraft, Martin-Marietta, and Boeing are currently working with the program (see "Experts on Nexpert").

Basically, *Nexpert* provides a framework in which to build a knowledge base—a set of rules that distill an expert's knowledge. Knowledge bases can have up to 500 rules and can be edited, modified, or even browsed in the form of a collection of flowcharts and block diagrams. To solve problems, *Nexpert* searches through a knowledge base by means of a special *inference engine,* which processes the data and hypotheses entered by a user and yields a set of conclusions. *Nexpert* doesn't replace human expertise, but it helps people understand and solve specific problems.

Creating a knowledge base is the most difficult part of setting up an expert system. All the rules must be written in the IF . . . THEN format, where IF is followed by a set of conditions (tests to be performed on data) and THEN is followed by a set of actions that take place when all the conditions of the IF statement are met. *Nexpert*'s hypotheses (included in the THEN part of a rule) have Boolean values, which means they can be rated as true, false, or unknown.

Nexpert has excellent tools for developing a knowledge base. The Rule Editor provides a template for creating rules and specifying the arguments, actions, and conclusions you want to include in your knowledge base. A set of operator boxes appears along the left side of the screen; from these boxes you

Nexpert's *engineers designed a program that can stand in for users' expertise—whether for medical or automotive diagnosis.*

Experts on Nexpert

Since *Nexpert* was released last October, the government, corporate, academic, and financial communities have shown a great deal of interest in the product. Neuron Data is aiming the product primarily at those Fortune 500 companies and government agencies that have staff AI experts or consultants who can evaluate and implement expert systems.

Neuron Data's Patrick Perez says that his company is also encouraging the development of run-time systems—expert systems that cannot be modified but can read any knowledge base. These programs will sell for $1000. In addition, the company plans to work with programmers to create consumer-oriented knowledge bases on such subjects as home health care or car maintenance. These programs will be compiled, so they can read only one knowledge base, and the cost will be more in line with other Macintosh software. Neuron Data provides free technical support for 90 days and one year of support and upgrades for $1000.

Nexpert in the Field

Among the first companies to purchase *Nexpert* is Hughes Aircraft. "*Nexpert*'s price-performance ratio is a plus," says John Roy, an AI specialist with Hughes. Roy is particularly impressed by *Nexpert*'s rule interaction network feature, which makes prototyping and debugging a knowledge base easier than on other systems. He uses the Apropos feature extensively and has a hard disk on which he stores *MacPaint* and text files that are linked to information in the knowledge base.

"*Nexpert*'s Rule Editor makes it possible to create knowledge bases without having to rely on an AI specialist sitting on the knowledge-domain expert's shoulder," says Roy. "An AI expert is required when you need to control the flow of a program—context and the knowledge processing strategy. But for many applications, *Nexpert*'s default strategies are adequate." Roy believes that with good documentation, people without experience in AI programming can develop small, relatively sophisticated expert systems.

As for drawbacks, Roy says that he would like to see more than one rule at a time on the screen. "The program could also have more frames and viewpoints, as in larger systems, where you can freeze a hypothetical situation into five separate conclusions." With *Nexpert* you need to rerun the program with a new set of values for the data for each conclusion.

choose which tests to perform on the IF part of the rules (see Figure 1). Hypotheses, which are entered in a column on the right side of the screen, are rendered true or false on the basis of these tests, or conditions.

Rules can trigger actions that affect the values of data in the system. For example, the Do option lets you assign values that result from computations to any object in the system, and the Show command displays text or graphics relevant to the knowledge being processed—such as a digitized illustration of a problem or solution. Rules also define operations such as calculations; such operations are similar to subroutines within a BASIC program. *Nexpert* lets you create rules that trigger other rules, and rules that link rules, or sets of rules, together through common data or hypotheses. Some rules might take into account uncertainty factors or allow the program to make assumptions about or draw inferences from unknown values.

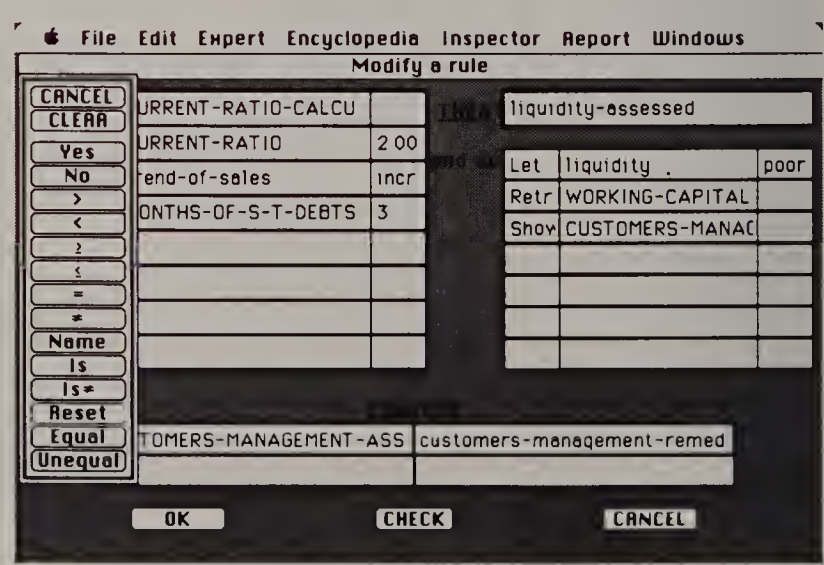


Figure 1

The structured rule editor. A rule consists of a list of conditions to be met (IF) and a hypothesis, which is a conclusion reached when the rule applies (THEN). You can also specify actions to be performed once the rule is applied and a context for rules.

The corporate accounting firm of Peat, Marwick, Mitchell & Co. is also evaluating *Nexpert*'s potential for automating its financial decision-making processes, especially in the area of loan-risk assessment. Aerospace companies such as Boeing are also interested, and so is ARCO, which wants to explore *Nexpert*'s ability to create expert systems for various oil drilling ventures. Scientists from NASA's Ames Research Center are exploring possible uses of the program for space shuttle flights and the planned space station. "If it works, we might take it up with us," NASA scientists told Perez.

Martin-Marietta is yet another interested company. Its energy systems, nuclear plants, and space station research would benefit from the increased automation that could be provided by an easy-to-learn expert system.

Albert Gouyet, Nexpert's *chief engineer, and two members of Neuron Data's founding trio—Alain Rappaport, a physician with a Ph.D. in molecular pharmacy, and Patrick Perez, a strategic planner who marketed the Mac in Europe—are pleased with the warm reception corporations have given the program.*

Albert Gouyet, chief engineer for *Nexpert,* says that the program will eventually have network and multiuser capabilities. "A user will be able to send values from a spreadsheet or a program that monitors a device, such as a satellite guidance system, to *Nexpert* via AppleTalk. *Nexpert* will then run its knowledge processor to diagnose the problem and send the conclusions based on the data back to the user."

At this point, Neuron Data is both delighted and surprised by all the attention *Nexpert* has drawn. Though the program is still out of the price range of the vast majority of Macintosh users, *Nexpert* has set a trend: expert systems, with all their intricacies and complexities, perform well on the Macintosh.

In its present version, *Nexpert* allows only eight conditions and actions for each rule. (To overcome this limitation, simply split the conditions into two rules and link them with an intermediate rule.)

As you create rules, the Rule Editor catalogs them alphabetically by the first letter of the hypotheses (see Figure 2). Alphabetizing the hypotheses makes it easy to find and alter the conditions of any rule. This extensive rule-editing capability effectively gives you the power to solve problems by creating a variety of "what-if" situations, much as you would in a spreadsheet.

The Knowledge Encyclopedia

Once you've entered the knowledge base, *Nexpert* automatically creates windows listing the data, hypotheses, rules, and categories you've input. These lists are essential to the system, since most requests for

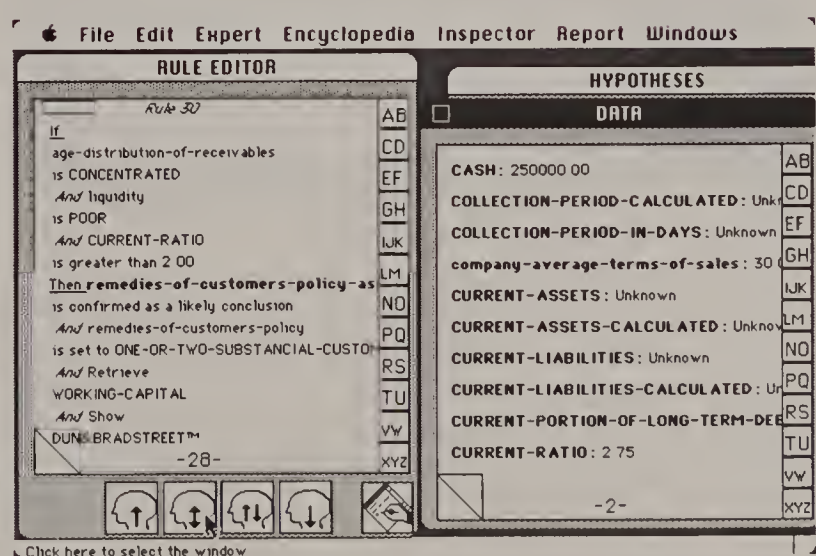


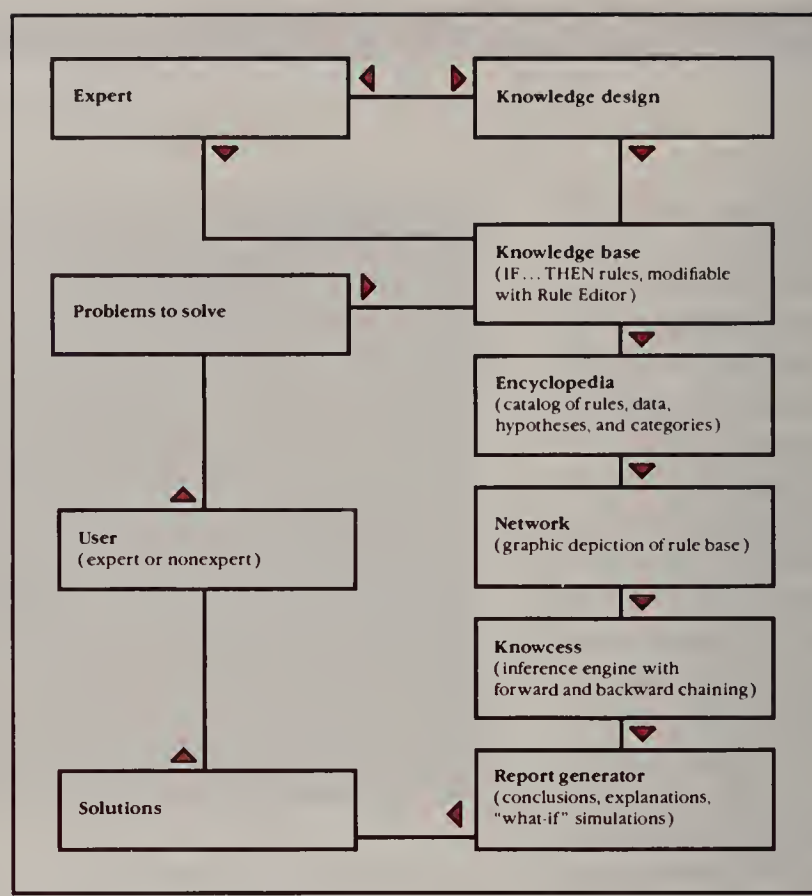
Figure 2

The Rule Editor, a window that duplicates the alphabetized Note Pad but has a series of five icons along the bottom. The first four icons let you create a new rule or modify, delete, or copy an old one. The fifth icon lets you save the knowledge base.

information or explanations involve selecting data, hypotheses, rules, or categories. You can easily browse through the lists to verify their accuracy, see the categories of information in the knowledge base, or look at the Boolean values of data.

You retrieve lists through the program's Encyclopedia menu. Each knowledge type is displayed in alphabetical order in its own Note Pad-style window. The program updates information in the windows whenever the system draws conclusions or the user adds new information to the knowledge base. You can edit the windows, type in text, or cut and paste at any time. You can also store information in the Encyclopedia windows on disk as text files.

Working with so many overlapping windows on screen can become confusing when you have several open windows and want to get at one of them. Like Lotus's *Jazz* and *Microsoft Excel, Nexpert* lists the opened windows in a separate menu, for easy tracking. *Nexpert* also displays a line at the bottom of the screen that continually prompts you with on-line help as you move from window to window and icon to icon through the program.



Expert System Design
One of the most critical steps in designing an expert system is ensuring the integrity of the knowledge base. The entire system could be corrupted by inaccurate information. The Macintosh's intuitive user interface augments Nexpert's *standard expert system components.*

Problem Presentation

After you have created a knowledge base, *Nexpert* is ready to solve problems. The first step in the problem-solving process is to provide information to the system about the problem. One method of presenting information is to input, or *volunteer,* data into the system. The data you volunteer consists of the signs, symptoms, objects, or other information that the program uses to determine whether a particular rule applies. For example, to present an automotive problem, you would select items from the data window—such as choke coil or idle speed—and input Boolean, numerical (real numbers), or descriptive (such as low, high, very high) values. If you selected Idle Speed from the Data window, the program might prompt you to enter a value. For situations in which problems can be consistently described by answering a set of questions, you can create forms to automate the volunteering process. Another way to input data is to read a file of values stored on disk into the system.

A third way to present a problem is to suggest a hypothesis for testing. When you suggest a hypothesis, the system asks you questions that test the validity of the hypothesis. A window called Active Report #1 appears as soon as you suggest a hypothesis. This dynamically updated alert box mechanism lets you follow the state of hypotheses as *Nexpert* tests them.

Problem Solving Approaches

The heart of an expert system is the inference engine, which processes the knowledge base to solve problems. *Nexpert's* inference engine approaches problems in three ways: Forward chaining is a process whereby *Nexpert* seeks out hypotheses that match the evidence (data) and investigates them. Backward chaining is the opposite—*Nexpert* works from suggested hypotheses to find the evidence. The third method is a mixed approach in which *Nexpert* gives priority to suggested hypotheses and later focuses on any new hypotheses generated from evidence given during initial explorations. In general, *Nexpert* solves problems through the mixed approach.

Nexpert lets you override the default settings of the inference engine. This ability provides a high level of control over the system, enabling you to focus the search on a specific part of the knowledge base.

A higher-level function of *Nexpert* is the Category Editor, which lets you classify data (conditions or IF statements in the Rule Editor) by categories. The Category Editor makes the system more coherent—more like human thought. A knowledge base may hold all the knowledge pertaining to a field, but the order in which the system requests information during knowledge processing may be inappropriate. For example, an expert system in medicine that simulates a consultation might ask for laboratory data before requesting

the patient's age or other primary details. The Category Editor lets you assign priorities to each category so that the system investigates data in a meaningful order.

Final hypotheses can also be sorted in categories. If the system discovers several relevant hypotheses, it investigates them in the order of the prioritized categories.

Reaching a Conclusion

Nexpert's Knowcess command activates the inference engine. This command operates only if the system has some information about the problem at hand. The What If command in the Expert menu lets you enter the world of hypothetical alternatives. At any time during a session, or even at the end of a session, you can perform "what-if" analyses by modifying a piece of information, adding new data, or adding new hypotheses. *Nexpert* reinfers its conclusions based on new data or hypotheses.

Another important command in the Expert menu is Load Knowledge Base. If you need supplementary information while working with a knowledge base, you can get it by loading other knowledge bases into the system. In effect, each knowledge base is a module that can combine with other modules to solve a problem. Since you enter all *Nexpert* knowledge bases in a standard format, you can maintain a library of knowledge bases on disk and call up a module as required.

This method is particularly helpful in diagnosing or troubleshooting problems in fields such as the medical sciences or aerospace engineering that require different sets of knowledge to resolve. The system also accepts SYLK format files, so you can use data imported from an *Excel* spreadsheet in *Nexpert*'s calculations.

Nexpert in Action

When the inference engine begins its reasoning process, three windows appear on screen that display information about the current state of the system. These are the Transcript window, which records the entire problem-solving session; the Hypothesis window, which shows the hypothesis that the system is currently investigating; and the Conclusions window, which recaps the conclusions the system reaches.

As the program works on a problem, it occasionally asks the user questions relevant to the reasoning process. *Nexpert* automatically generates questions and formats them in a dialog box, displaying the questions and answers according to the type of value expected (see Figure 3).

A critical feature of any expert system is its ability to explain its own behavior. The Question dialog box allows you to ask why the currently requested data is important to the problem-solving mechanism. If, for example, you want to determine the major reasons why a hypothesis was confirmed, click on a Why button in the Rule, Hypothesis, or Conclusions window. An explanation supporting the system's confirmation or rejection appears. You can examine the system's solving strategy at a higher level of detail by clicking on the How or Why button in the Explanation window.

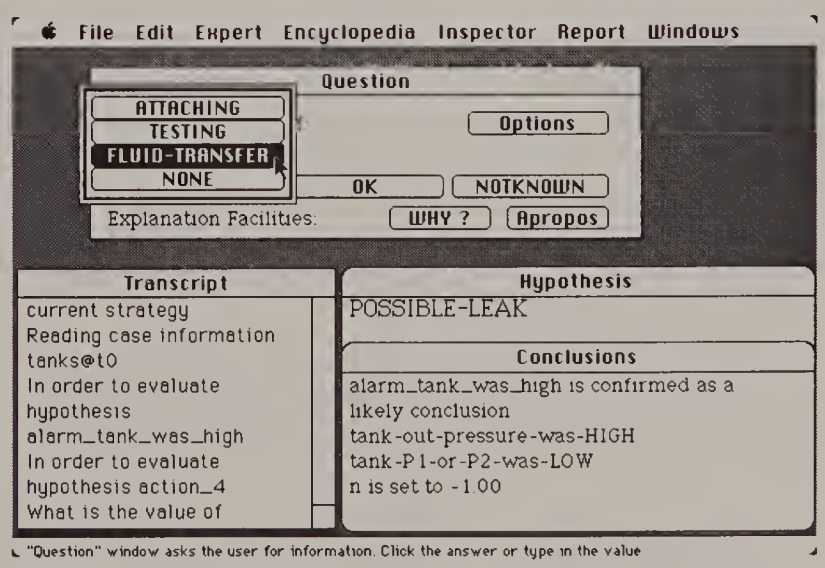
Check the Conclusions window to determine what conclusions have been reached at any point in the reasoning process. Clicking on the Why button at the bottom of the Conclusions window gives an explanation for the confirmation or rejection of a hypothesis. Clicking the Apropos button displays any fixed information linked to the selected hypothesis or data.

When you've reached a state in which no other part of the knowledge base is relevant to the current problem and no further information is needed, a window appears indicating the end of the session.

Graphics and Reports

Nexpert lets you link graphics or text to data through the Apropos option; this procedure provides additional explanation of a conclusion. Clicking on the Apropos button yields graphics, such as digitized images or *MacPaint* drawings, or text, such as explanations of computations performed on requested data. Apropos information is available through the Hypothesis, Rule, or Conclusion window. Apropos is also an option in the Encyclopedia menu.

Viewing information graphically makes understanding the complexities of an expert system easier. *Nexpert*'s Browse Network option shows you the system's reasoning path toward a given solution by drawing lines between related conclusions *Nexpert* has reached (see Figure 4). This feature enables you to see the sequence of choices leading to a particular conclusion and to determine the role of any rule or set of rules in the final decision. The Overview option charts



"Question" window asks the user for information. Click the answer or type in the value

Figure 3

Nexpert *automatically asks the user relevant questions as it evaluates a hypothesis. You select Options to input data. The Why and Apropos buttons provide explanations or further information about the current investigation.*

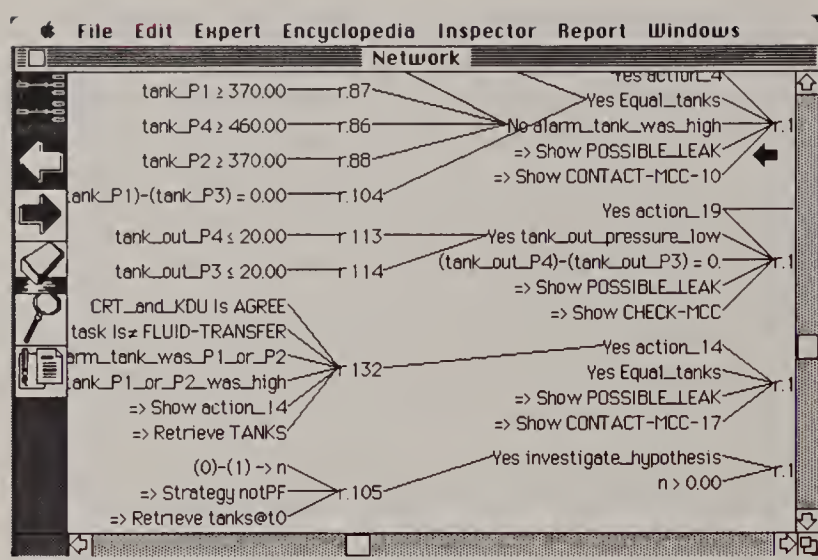


Figure 4
Nexpert *displays a graphic representation of conclusions reached by the system. The series of icons at the left lets you navigate within the network. Information is dynamically updated as new conclusions are reached.*

the entire network. The icons on the left side of the screen let you navigate within the network. You can move through this chart in two directions: from global information (hypotheses/goals) to local knowledge (conditions/data) or vice versa. In either case, this chart effectively shows the connections between various parts of the knowledge base.

Within one session, the Inspector receives the information from each inference and dynamically updates and redraws the knowledge base chart. A menu option lets you change the graphics settings so that you can tailor the knowledge chart's size, fonts, and icons. When different people investigate the same problem, printing out the entire chart reveals the processes by which they arrived at their conclusions.

Nexpert reports can be printed out or saved to disk. The Case Status command lists all the data relevant to the current problem, along with a list of confirmed and rejected hypotheses. You can print Case Status immediately or store it on disk at any time during a session with *Nexpert*. Full Report lists all the rules the system used to confirm its conclusions and provides detailed explanations.

For more selective reporting, the Explain Conclusion option gives a text description of how *Nexpert* confirmed or rejected the rules and hypotheses that led the system to a conclusion.

Overview

This article describes only some of the significant features and functions of the program. *Nexpert* gives you a great deal of control and flexibility. The program looks and feels native to the Macintosh, taking full advantage of the mouse, cut and paste capabilities, pull-down menus, and windowing environment. Without doubt, *Nexpert* is one of the most advanced software programs yet to come to market for the Macintosh or any other microcomputer; in its own field *Nexpert* is comparable to the number-crunching power of *Excel* or the seamless integration of *Jazz*.

Intended primarily for the specialist—the financial planner, engineer, medical doctor, or expert system developer—the program's ease of use opens the door to a broader range of professionals. However, a programming novice or a person with little understanding of AI principles can take advantage of only a fraction of the program's power. A knowledge base could help a stockbroker with some training make decisions regarding a client's portfolio, for example, but unless the stockbroker had some knowledge of cognitive science, computer science, or artificial intelligence, developing and using the knowledge base in a sophisticated manner would be difficult.

For the uninitiated, *Nexpert* is like a complex, abstract work of art: appreciating it requires a lot of systematic thinking—even given the program's well-designed user interface. A simplified version of *Nexpert* aimed at less technical users, more thorough documentation with tutorials and technical support, and a lower price would bring Neuron Data's expert system technology to a wider spectrum of business and education professionals. In the near future we hope to see more Macintosh expert system development tools emerge from Neuron Data and other companies—tools that would allow more of us to use our expertise to create knowledge bases that could be universally understood and applied to a host of modern-day problems. □

◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆

Nexpert
Neuron Data Corp.
444 High St.
Palo Alto, CA 94301
415/321-4488
List price: $5000, run-time only $1000

◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ *Tom Maremaa is a software developer and a former senior writer for* InfoWorld *magazine. Daniel Farber is an Associate Editor of* Macworld.

For all of you who thought Dennis Brothers was crazy to give away MacTEP,™ here's MicroPhone.™ The one he's selling.

When the Macintosh first came out, the most powerful personal computer ever built didn't have the brains to make a phone call.

So Dennis Brothers tore down his Mac, figured out how it worked, and wrote Mac's first communications program, MacTEP.

Which he proceeded to give away.

MacTEP was a classic. The first standard in Mac communications.

Now he's created the second: MicroPhone. A program that goes far beyond any communications software currently offered for any computer.

MicroPhone is so sophisticated, it cuts through the worst tangles you encounter when you go on-line. A delight to the experienced. And a saviour for the novice.

Run on automatic.

When you open MicroPhone to the desktop you'll find a comprehensive collection of icons pre-programmed to access all major information services: CompuServe,® Dow Jones News/Retrieval,® The Source,℠ Delphi,™ the works.

A few clicks and you're in. With automatic log-in and sign-on.

But that's just the beginning of its ability to automate the whole telecommunications process. For MicroPhone features the most powerful, yet simplest to set up macros ever seen on a program.

Write your own script.

Dennis gives you two ways to create these macros. The first is to set MicroPhone in the Watch Me,™ the recording mode.

The program looks over your shoulder as you conduct a communications session following your keyboard and menu commands.

MicroPhone can remember not only an uninterrupted string of keyboard commands, but also wait-for-prompt conditions. In fact, virtually any series, no matter how long or complex.

The entire sequence is saved. To be invoked at any time with a single key command.

The second way to generate macros is through MicroPhone's unique "Script" window. Open it and you'll discover an extensive set of functions which can be called up and linked with a series of mouse clicks. The resulting macro is extremely powerful. The method is Mac-simple.

Using Watch Me or the Script window, or a combination of both, you can automate log-ons, file transfers and unattended operations. And navigate back into the farthest reaches of any database with a single stroke.

Make files fly.

Sending and receiving files is faster and easier with MicroPhone, too. Using XMODEM protocols and MacBinary, MicroPhone transmits or receives anything you can create on a Macintosh. Including MacPaint documents, text, spreadsheets, charts, database tables, or programs.

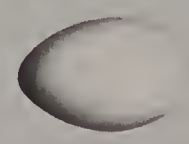
MicroPhone allows you to scroll back and forth at high speed to review your session. Then you can select any portion of your session, print it, save it to a file, or copy it to the Clipboard for use by other Macintosh programs.

MicroPhone also features an editor desk accessory for composing text in mid-session using familiar Macintosh editing techniques.

But enough talk. See for yourself what Dennis Brothers has done now to advance the cause of telecommunications. Just take any major credit card in hand and call us toll free to place your order.

Dennis isn't giving it away this time. But at **$74.95**, almost.

Let's get technical box.
Runs in terminal emulation mode at speeds up to 57.6K Baud. Emulates DEC™ VT52,™ VT100™ and TTY type terminals. Supports TEXT (ASCII) and XMODEM (Christensen) protocols, send and receive. Supports MacBinary. Runs on 128K and 512K Macintosh. LaserWriter compatible. Includes Switcher for use with other Macintosh programs. Compatible with Hayes, Apple and other leading modems. Built-in full text editor licensed from Dreams of the Phoenix Inc. Documentation by Neil Shapiro.



SOFTWARE VENTURES™

The traditional clip-out coupon.
With an untraditional money-back guarantee.

You know how to telecommunicate the hard way. Now do it the easy way. Call 24 hours toll free. Outside California, 800-DENNIS-7. Within California, 800-DENNIS-8. In Canada, 800-DENNIS-9. Or send a check, money order or credit card number for $_____ for ____ copies of Dennis Brothers' MicroPhone @ $74.95 each.

In USA and Canada add US $5.00 for postage and handling per product ordered. All other countries add US $10.00. In California add 6% ($4.50) sales tax. ALL FOREIGN ORDERS: please make payment by bank draft, payable in US dollars, drawn on a US bank. No C.O.D. or Purchase Orders. If you are not 100% happy, return MicroPhone within 30 days for a full refund.

☐ VISA ☐ MASTERCARD ☐ CHECK ☐ MONEY ORDER

CREDIT CARD # _____ EXPIRES _____

SEND TO: NAME _____

SHIPPING ADDRESS _____ CITY _____

STATE _____ ZIP _____

Send to: SOFTWARE VENTURES, DEPARTMENT A, 2907 Claremont Avenue, Suite 220, Berkeley, CA 94705

MicroPhone and Watch Me are trademarks of Software Ventures Corporation. MacTEP is a trademark of Brothers Associates. Macintosh is a trademark licensed to Apple Computer, Inc. LaserWriter and Switcher are trademarks of Apple Computer, Inc. CompuServe is a registered trademark of CompuServe Corp. Dow Jones News/Retrieval is a registered trademark of Dow Jones & Company, Inc. The Source is a service mark of Source Telecomputing Corp., a subsidiary of The Readers Digest Association, Inc. Delphi is a trademark of General Videotex Corp. DEC, VT52 and VT100 are trademarks of Digital Equipment Corporation. © 1985 Software Ventures Corporation

Circle 500 on reader service card

Putting VideoWorks to Work

Erfert Nielson

Most people think of VideoWorks *as entertainment software. But this animation program has a serious side as well. The next time you find yourself illustrating a business presentation using* MacPaint, MacDraw, Microsoft Chart, *or another venerable member of your software collection, consider adding the element of motion to help get your point across.* VideoWorks *can add life to charts, tables, and even memos, making a report or presentation catch the viewer's eye.*

The project described here—the creation of a memo that comes to life, followed by an animated bar chart—gives you an idea of *VideoWorks'* potential as a business presentation tool. Perhaps you'll use some of the techniques shown here in your own animations. You should be familiar with basic *VideoWorks* terms and procedures (see "A Moving Pixel Show," *Macworld,* November 1985).

A Sample Scenario

Describing an animated sequence in writing is like trying to teach someone a dance step over the phone: something is lost in the translation. The following description, however, combined with Figure 1, should give you an idea of how the animation proceeds.

A disk, labeled simply "Ticket Sales Chart," is inserted by the manager of a small movie theater. The first half of the animation is a memo with a chart showing the number of tickets sold each month from July through December. What appears to be a document created with *MacWrite* and *MacPaint* is immediately displayed on the screen. After 5 or 6 seconds, however, the movie projector logo suddenly sputters to life. The reels spin, the projector's motor whirs, and the title of the presentation appears on the movie screen.

Then the ticket sales chart appears on the Mac's screen. One by one, strips of tickets rise from the bottom of the chart until the month's total is reached, at which point the number of tickets sold pops on screen. December was a record sales month for the movie theater, a fact that is dramatized by the last strip of tickets breaking through the top of the chart, complete with flying debris and the sound of an explosion.

Plan Ahead

Before you begin a *VideoWorks* production, you should have a clear idea of how you want the finished animation to look. This means mapping out, either in your head or on paper, the steps your animated elements, or *sprites,* will follow. Organizing an animation in advance keeps you from running into editing problems several hours into a project.

Be as economical as possible in the number of separate elements you animate. Animating numerous, graphically complex sprites uses up memory and slows down the animation. The two parts of the animation project described here are relatively small (8K apiece) and could be created on a 128K Mac. You may need to use a 512K Mac for more ambitious animations.

Another factor to consider is *foreground priority.* The first sprite you place in an animation is in the background. The second sprite added overlaps the first, the third overlaps the first two, and so on. Insert-

SALES, JULY - DEC.
X0.8 WIDE CONVERTER
A14x9 FUJI

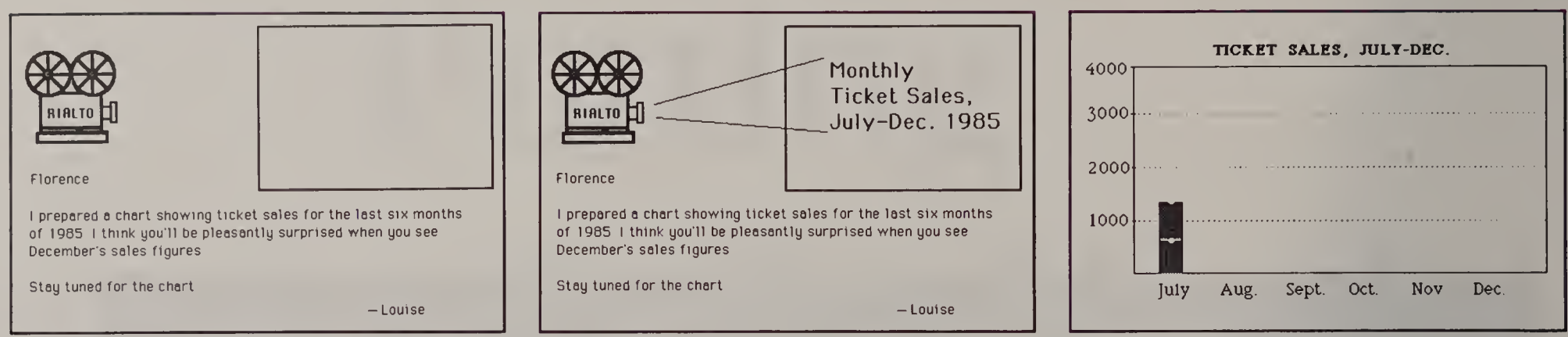


Figure 1
It's not quite poetry in motion, but this animated memo and chart is eye-catching nonetheless. The animation starts with a cover letter that looks ordinary enough until the projector in the letterhead beams the chart's title on a screen. The chart itself follows, with ticket strips climbing one after the other up the heretofore empty grid.

ing background sprites first saves you editing headaches. (Read the "Hints, Tips, and Caveats" section of the *VideoWorks* manual for more information on streamlining the animation process.)

The Moving Memo

The movie theater memo is the simpler of the two sequences. This animation has only five elements, or *castmembers*. They are, in order of appearance, the movie projector, the text of the memo, the rectangular movie screen, a slightly altered version of the projector, and the projector beam and presentation title. *VideoWorks* provides a low-rent version of *MacPaint* called CheapPaint, but I drew the projector in *MacPaint* so I could make use of T/Maker Graphics' *ClickArt Effects,* a *MacPaint* desk accessory that slants, rotates, and distorts selected objects. Draw the projector's film reels using the circle and straight line tools and then use *ClickArt Effects* to rotate the reels a few degrees. Copy the original projector and add the rotated reels to the second projector. Save the document and copy it to a data disk.

To begin building the animation, open a new *VideoWorks* file and select CheapPaint from the Windows menu. Then select Art Grabber from the Apple menu and "grab" the original projector from the *MacPaint* document. (Art Grabber lets you open *MacPaint* documents from within *VideoWorks* and paste pieces of them into CheapPaint.) Pasting the projector into a CheapPaint easel automatically adds it to the Cast window as the first castmember.

Type the text of the memo with CheapPaint's text function and then use the rectangle tool to create the movie screen. Next, use Art Grabber to place the second projector into a CheapPaint easel and into the cast. Finally, draw the projector beam and type the title that appears on the movie screen. With the five castmembers safely ensconced in the Cast window, save the file. It's a good idea to save frequently; even with careful planning you may occasionally need to use Revert to return to the last version saved if an experiment proves spectacularly unsuccessful.

Since none of the castmembers in the memo do much in the way of jumping about on screen, animating the memo is fairly easy. Click the first projector in the Cast window and drag it into position on screen. Then add that castmember to the first channel of the animation with the Step command (⌘-S). Open the Score window, highlight 80 frames of channel A (the projector sits idle for several seconds, as you'll recall), and use the InBetween command to place the projector in all 80 frames. Follow the same procedure to place the text and the movie screen in the first 80 frames of channels B and C.

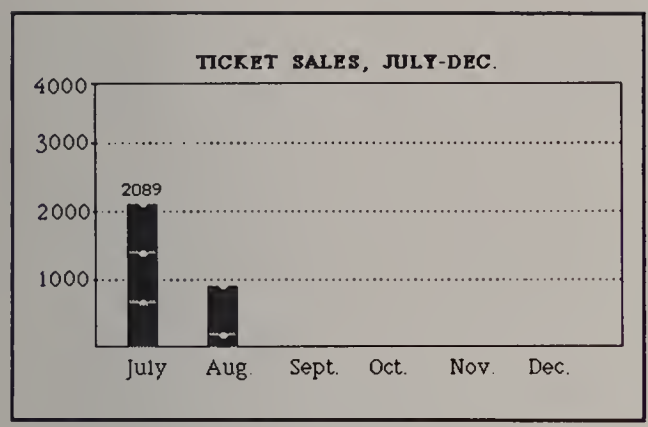
To start the projector rolling, use the Switch command to replace the first projector's image on screen with the second's. With the Step command, place the second projector in frame 81 of channel A. Then use Copy and Paste to place alternating images of the first and second projector in the next hundred or so frames of the score, creating the illusion that the reels are rotating. You have to copy and paste repeatedly; begin with the initial pair of alternating images and double the number of frames in the sprite each time you copy and paste. Play back the sequence as you put it together to see what the animation looks like.

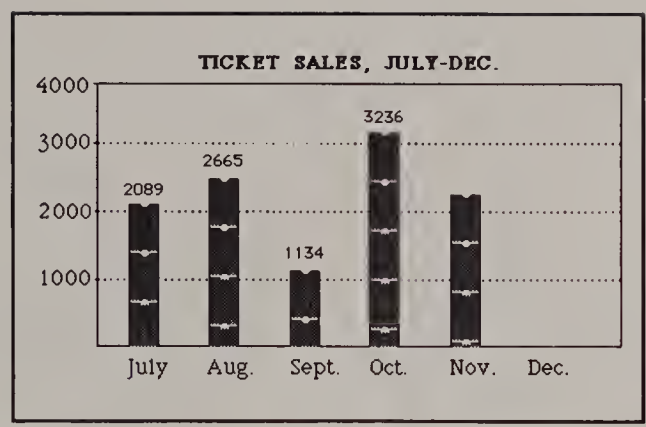
To complete the animated memo, add the projector beam and title beginning at frame 81 of channel D. Drag that castmember into position and then select Or from the Efx (special effects) menu so the beam of light appears transparent, allowing the screen to show through behind it. Make sure that the playback head—the black square that runs along the bottom of the Score window—is positioned under the proper frame before you add the projector beam and title to the score. Add the idling motor sound effect from the Sfx menu to the score and adjust the animation's speed in the Panel window to complete the first half of the animation.

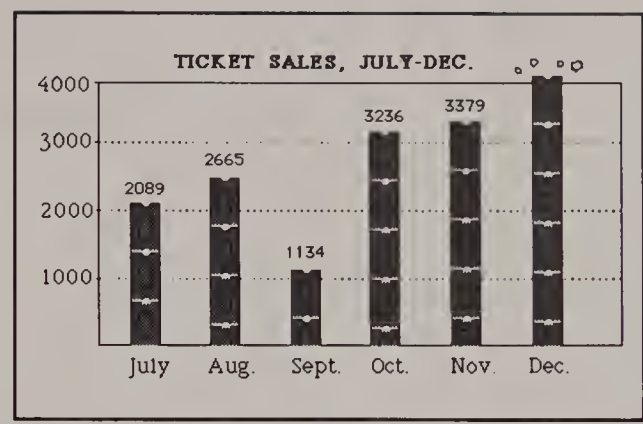
Top of the Chart

Make a backup copy of the first sequence and take a break. You're now ready to proceed with the second part of the presentation. The first element to enter in the animated chart sequence is the background rectangle, complete with title, numbers along the left side, and dotted lines delineating each thousand tickets sold.

The next castmember is the strip of tickets, which you can draw with CheapPaint's filled rectangle and pencil tools. Although the strip of tickets appears six times in the animation, you insert it into the Cast window only once; for each month you drag the same castmember into position on the screen, adding it to different channels with the Step command.







To animate the strips of tickets, which climb smoothly up the chart, place the first strip directly beneath the bottom line of the chart and then select the Tweak window, which allows you to move an object a precise number of pixels in a specified direction. In this case set Tweak to move the strip of tickets 3 pixels up and 0 pixels horizontally (see Figure 2). Clicking the Tweak window's Do It button moves the strip of tickets straight up 3 pixels. Add a frame after each tweak with the Step command, repeating this procedure until the strip reaches its proper height. Then add the number of tickets sold at the top of the strip. Each of these numbers is a separate castmember, created with CheapPaint's text function.

Because the second strip of tickets starts rising after the first strip reaches its full height, choose an insertion point in the Score window that begins animating the second strip after the first one stops moving. Repeat the procedure for each strip of tickets (see Figure 3).

The final strip of tickets bursts through the top of the chart, producing a small explosion as several chunks of the chart fly through the air. Each chunk is a separate castmember, added to the score at the point when the tickets first hit the top of the chart and animated frame by frame. To complete the chart-bursting effect, insert the medium explosion from the Sfx menu into the score so that it is in sync with the tickets breaking through.

At this point the animation is nearly complete. You are faced with a ragged array of ticket stubs hanging below the chart, however. I had to experiment a bit to cover them up. Draw a black, borderless rectangle in CheapPaint, place it over the unsightly ends of the ticket strips, and select Bic (Blank is changed) from the Efx menu. This special effect causes a black castmember to turn white if it's placed on a white background. To finish the job, add the months July through December to the bottom of the chart.

You now have two *VideoWorks* documents, which you chain together into a continuous presentation. Open a new *VideoWorks* document and choose Demo List from the File menu. A dialog box appears, asking for the list of the documents to include in the playback sequence. Type the names of the documents in the order you want them played and click OK. Then save the document as Demo List and return to the desktop.

To begin the presentation as soon as the disk is inserted, use VideoWorks Player from Hayden's *Macro-Mind Utilities Disk (M.U.D.)* collection. This 13K utility allows you to play back *VideoWorks* animations without the *VideoWorks* application itself. For an animated presentation that gets moving at startup, copy the System Folder and VW Player from the *M.U.D.* disk onto a blank disk, along with your animation documents and the Demo List document from the *VideoWorks* disk. Insert the new disk, click the VideoWorks Player icon, and select Set Startup from the Special menu. Now you have a presentation disk that automatically starts the animated memo and continues with the ticket sales chart.

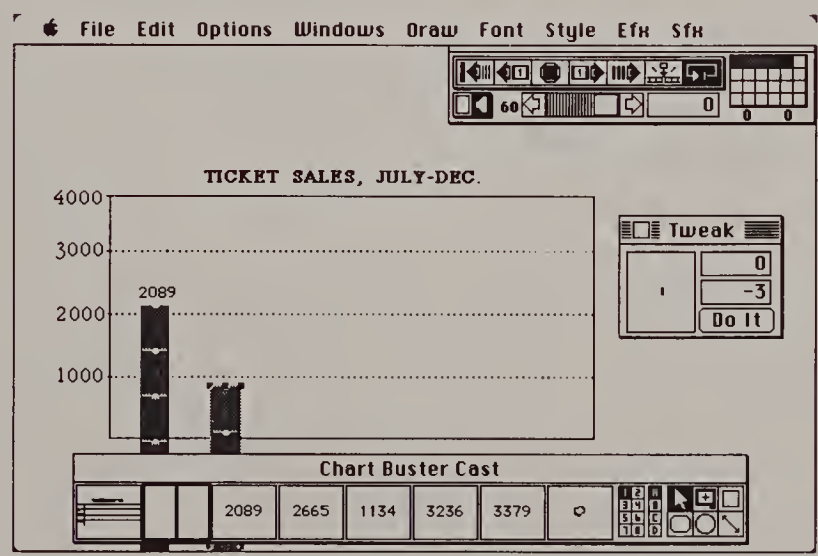


Figure 2
VideoWorks' *Tweak window allows you to move a selected castmember a specified number of pixels horizontally and vertically. Here the strip of tickets for August is set to move directly up the screen 3 pixels at a time.*

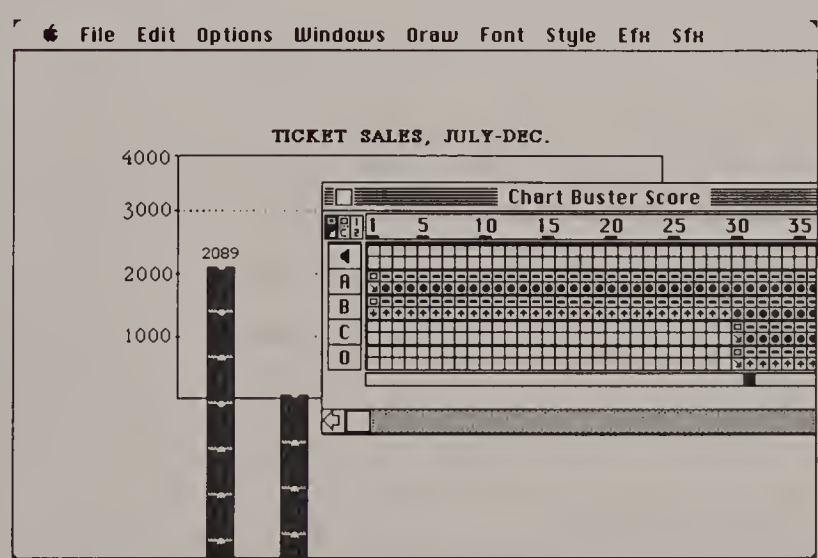


Figure 3
So that the ticket strips appear in sequence, the first frame of the next ticket strip appears in another channel of the score after the last strip stops. In this Score window the July ticket strip in channel B stops moving in frame 29, and the August ticket strip in channel D makes its appearance in frame 30 and starts climbing in frame 31.

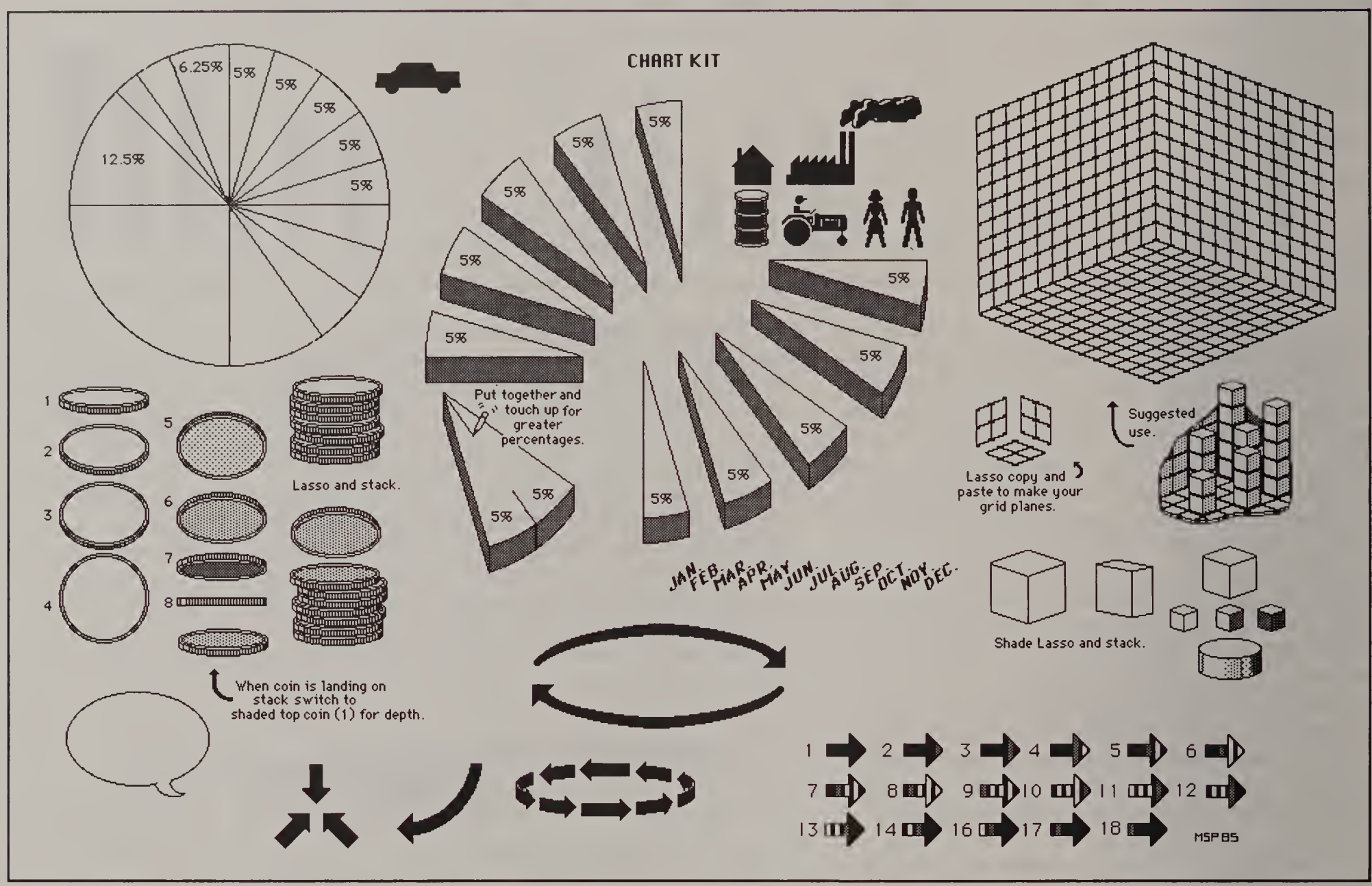


Figure 4
You don't have to start from scratch when animating charts. VideoWorks' *Art disk contains this chart kit with arrows, pie slices, a three-dimensional grid, and other handy graphic elements. Graphics pasted in from other programs, such as* Microsoft Chart, *also save you from working overtime.*

As you can see from this description, creating even a simple *VideoWorks* animation entails quite a few steps. The Chart Kit provided on the program's Art disk (see Figure 4) can save some time and effort, as can companion programs like *ClickArtEffects* and three-dimensional graphics programs such as Enabling Technologies' *Easy3D* and Challenger Software's *Mac3D*. You might want to use screen shots of *Chart, Jazz,* or *Excel* charts as the basis for an animation, saving you the trouble of drawing the initial chart or graph. Although you'll find putting together a *VideoWorks* business presentation more time-consuming than creating a graph with *Microsoft Chart* or an organizational chart with *MacDraw,* I think you'll find the results more rewarding and the presentation more effective as well. □

Erfert Nielson is an Assistant Editor of Macworld.

VideoWorks, MacroMind Utilities Disk (M.U.D.)
Hayden Software Co.
650 Suffolk St.
Lowell, MA 01854
800/343-1218, 617/937-0200 in Massachusetts
List price: VideoWorks $99.95, M.U.D. $49.95

ClickArt Effects
T/Maker Graphics
2115 Landings Dr.
Mountain View, CA 94043
415/962-0195
List price: $49.95

Easy3D
Enabling Technologies
600 S. Dearborn #1306
Chicago, IL 60605
800/621-1203, 800/942-2835 in Illinois
List price: $99

Mac3D
Challenger Software Corp.
18350 Kedzie Ave.
Homewood, IL 60430
312/957-3475
List price: $195

We'll Give You A Hand With EXCEL

Notes...™ is Your Shortcut to Excel

Comprehensive on-line information on all the commands and functions of Excel gives you quick access to key information. Use the Table of Contents, the find command, or the over 300 interactive cross-references. ***Basics*** *gets you started while* ***Expert Tips*** *and* ***Advanced Features*** *put you in command of the power of Excel.*

Speed Data Entry

Shortcuts and tips show you how to operate Excel more efficiently such as choosing among selections in a dialog box or moving around the spreadsheet without using the mouse.

Create Custom Number Formats

Notes explains how to create your own custom number formats for part numbers, dates, social security numbers, and more.

Macros Made Easy

Notes makes Macros easy with step by step instructions. Learn how to use Excel's Recorder to create command macros for automating worksheets and how to create function macros.

Mailmerge With Excel

Notes shows you how to merge letters with your mailing list. It also shows you how to create specialized reports and use wildcards with your databases.

Charts: Which One to Use and How to Create Them

Notes advises you on which type of graph to use and how to create it. Notes helps make graph creation simple.

Templates to Run Your Business Today

12 Templates for Accounting, Finance, and Administrative activities from Cash Journals to Loan Amortization tables to an Employee Database. On-line documentation helps you customize the templates for your business.

Figure Your Payroll With Excel

The Payroll template links with the Employee Database to calculate payroll figures for each period including gross wages, deductions, federal withholding and FICA.

Track Accounts Receivable and Payable

Track outstanding invoices and bills and keep on top of how old each receivable or payable is. Automatically calculate the average age of your receivables and payables.

Analyze Your Cash Flow

Review cash in and cash out projections to be on top of your cash needs. Tie Cash Flow into the budget template for even better planning.

Graph Your Sales and Profit Margins

Spot trends in your financial statements with Excel charts linked directly to the Financial Statements template.

Tap the Power of Excel Database Commands

See how to use the Series command to create date labels and calendars. Tap the power of the Tables command by using Notes.

Document Your Own Work

Add your custom notes into Notes to document your own templates, provide help for others, or just add your own personal tips and reminders.

Notes for Jazz™ offers the same great shortcuts and templates.

Please send me ☐ *Notes for Excel* ☐ *Notes for Jazz*

☐ *My check or money order for $79 is enclosed.*

☐ *Charge my:* ☐ *VISA* ☐ *MasterCard*

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ *Account Number*

☐☐ – ☐☐ *Expiration Date*

Signature

$79.

Name: _____

Address: _____

City: _____

State: _____ *Zip Code:* _____

Unconditional Guarantee: *Try Notes for 30 days and if it's not all you hoped it would be, return it for a full refund. Mail this coupon with your payment to Layered, Inc., 85 Merrimac St., Boston, Mass 02114 To charge by phone, call 1-800-262-6620 (in Mass. call 617-423-9041) and ask for Operator A.*

© 1986, Layered, Inc. Jazz is a trademark of Lotus Development Corp. Microsoft is a trademark of Microsoft Corp. Notes and Layered are trademarks of Layered, Inc.

LAYERED

Circle 125 on reader service card

Jim Hoyt, Apple's chief architect for its AppleLink dealer network, is now preparing an Apple II version for educators.

The Telecom Link

Tom Moran

Marie O'Connor of Future Information Systems' Manhattan branch shows how the 22-store chain keeps in touch via AppleLink.

Would you like to have direct access to Apple's technical databases? Receive answers to most of your technical questions in minutes? Send an E-mail message to a dozen remote locations in a minute or two? All without learning a complex command structure?

For years analysts have agreed that vast new telecommunications markets would open up when the thorny problem of the human interface was solved. The observers have said that until telecom services become easier to learn and use, they would only attract hackers and sophisticated business

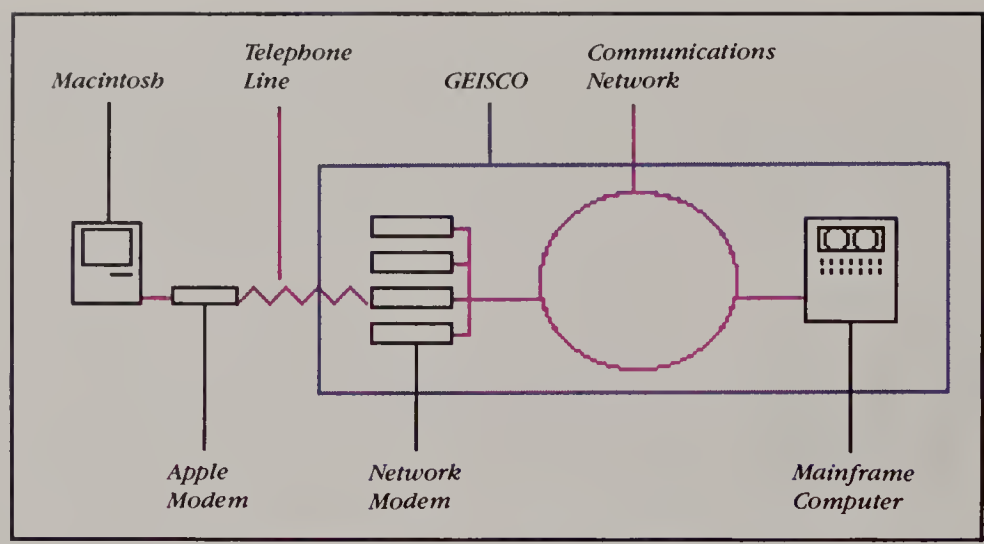


Figure 1
From Mac to mainframe: With AppleLink, GEISCO's Mark III network connects Apple dealers, developers, and user groups to Apple-related databases.

users. AppleLink, a telecommunications package that combines the powerful Macintosh human interface with GEISCO's (General Electric Information Systems Company) enormous network system, may prove to be just the revolutionary telecommunications product to do the trick—and a means of elevating Apple's products to where few Macs have gone before, Fortune 500 Heaven.

AppleLink replaces the complex commands of most telecommunications systems with the Macintosh's familiar desktop metaphor and straightforward user interface. To access the system, insert an AppleLink disk, choose Connect, and type in your password; AppleLink accesses GEISCO's Mark III network, the largest commercial distributed network in the world (see Figures 1 and 2). A distributed network stores data in more than one place, in this case in three locations in the United States. The GEISCO mainframes now contain software that allows them to understand and answer queries from Macintoshes. You can access the GEISCO mainframes from 750 cities in 31 countries.

After connection, the AppleLink desktop containing icons for different services appears. The services vary according to whether the user is a developer, a user-group representative, a dealer, or an employee of a dealer (see Figure 3). Newspaper icons appear for Apple corporate news and other news services; library icons appear for databases such as technical information, sales and support, and product and service prices. An Alert icon indicates crucial messages from Apple.

Clicking on a library icon brings up a search window where you enter key words or phrases and click on Search Library to initiate a full-text search. A full-text search is more comprehensive than a keyword search, which looks only at words and phrases previously indexed. AppleLink indicates the number of references found, and you widen or narrow the criteria to get a manageable number of folders containing the keywords. When you click Display Selections, you see the contents of the folders. The host software on GEISCO's mainframes keeps track of "no hits"—searches that get no answer. If enough queries on the same subject go unanswered, the program alerts the system administrator so an answer can be found. The program also notes if a particular user keeps missing the mark, so the system administrator can advise more effective search strategies. By navigating the technical libraries, dealers and developers get rapid answers to technical questions 24 hours a day, seven days a week without relying on Apple's technical support staff.

As powerful as the database features are, AppleLink's centerpiece is its electronic mail. On the right-hand side of the AppleLink desktop are an In Basket and an Out Basket. Large arrows in the baskets indicate the presence of messages. The electronic mail capability lets any Apple employee, dealer, developer, or user-group administrator communicate quickly and rapidly with another AppleLink user. AppleLink transfers binary files, software, graphics, spreadsheets, and so on. (Off-line composition of E-mail messages re-

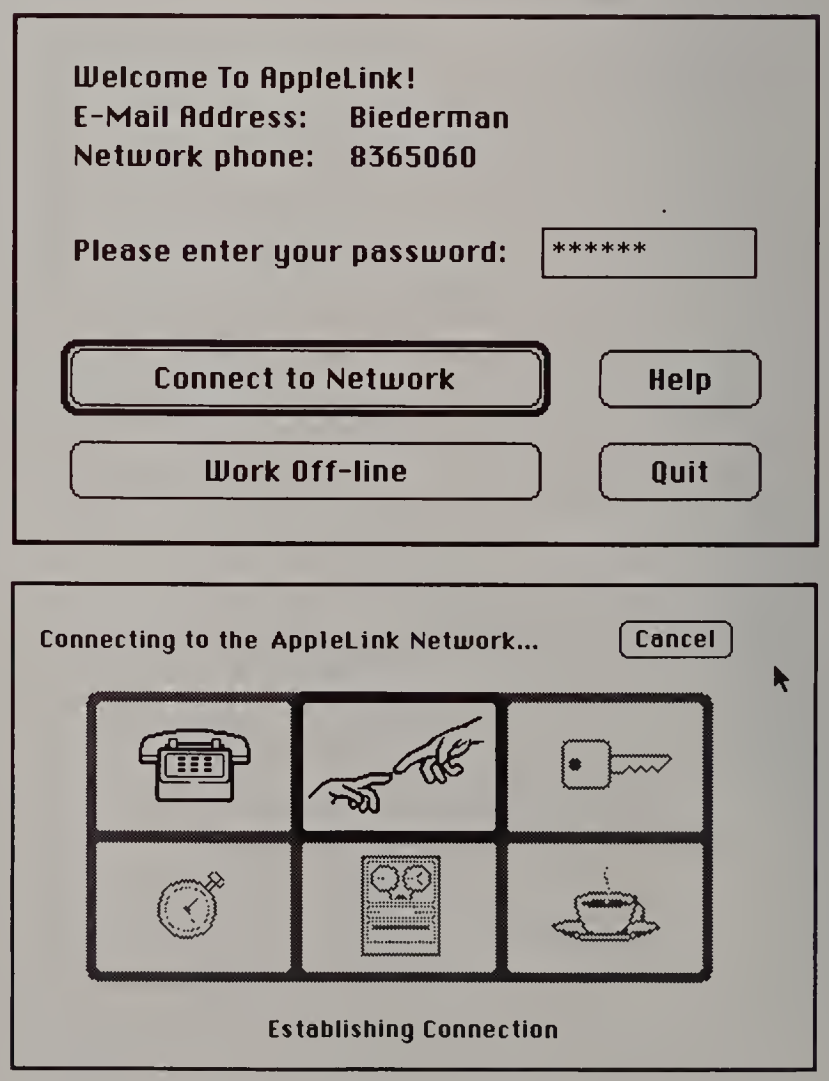


Figure 2
To connect to AppleLink, you need only enter your password. A series of symbols marks the progress of the automated log-on.

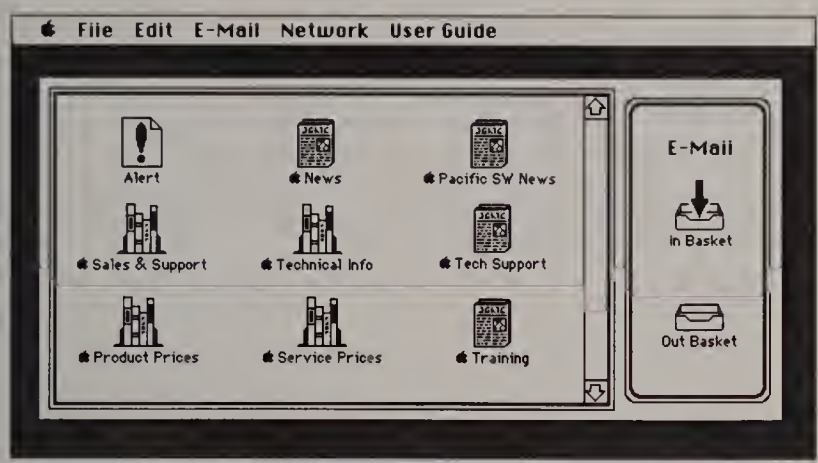


Figure 3
Once connected to the remote mainframe, desktop icons help AppleLink users navigate through Apple's database libraries and electronic mail system.

duces connection time.) You can cut and paste from E-mail, database, or bulletin board files to E-mail messages, and you can use the service to transfer graphics files from *MacPaint, MacDraw,* and *Jazz.* The system can transfer documents created with applications such as *MacWrite, MacTerminal,* Macintosh Pascal, Microsoft BASIC, and others.

AppleLink began as a technical support service for dealers. Before AppleLink, dealers could call Apple's support department only during West Coast business hours, and even then they would often get a busy signal. But since AppleLink became available to dealers last July, they have 24-hour access to a technical support database.

AppleLink gives Apple better customer support; improves communication with dealers, developers, user groups, and its own sales force; and provides huge savings in printing and mailing costs for price lists, technical updates, and other communications with dealers.

Mac Interface the Key to AppleLink

Apple's Jim Hoyt, who worked with Pete Burnight of Central Coast Software in Santa Cruz, California, to create AppleLink, says that Apple wanted to eliminate typed commands completely. "What we tried to do with AppleLink was to take all that stuff out of the way," he says. "We really tried for transparency."

Ali Saeedi, who is in charge of operations at Infomax, a chain of computer stores in Northern California, says AppleLink takes advantage of the Macintosh's simple user interface. "As a result, the AppleLink interface is very simple and intuitive." Infomax's need to communicate—among its own stores as well as with Apple—is so enormous, says Saeedi, that telephoning takes too much time.

"With AppleLink you can send a message to a lot of people in a short time. Before, we had to call Apple or send an order [for merchandise] by Federal Express; now we just type it in on AppleLink, and in 5 minutes the Apple support center has the order." Saeedi also likes AppleLink's technical support features, which have made it possible to answer many more customers' questions on the first try than before. "Our people depend on it now, which is saying a lot."

Saeedi believes that AppleLink's user-friendliness makes the system superior to IBM's dealer support system, CSS (Customer Support Service). "From IBM I get a steady stream of memos and documents that come Federal Express every day," he says. "They also send the same information through CSS, which is good, but because the user interface is not as good and not all [of IBM's] stores have CSS, all that information has to be sent by Federal Express anyway."

Peter Friedman, manager of desktop communications marketing at Apple, says that AppleLink is an excellent example of how the Mac, "with all its advantages in the communications arena, really makes information a usable resource." Friedman points out the Macintosh's ability to navigate through the information system: the Mac provides "a visual metaphor for communication so it's much more understandable. [And] you can create, manipulate, and transmit graphics." Friedman says that the development of communications solutions characterized by these Macintosh advantages is "one of our future directions."

BusinessTalk: AppleLink for Business

GEISCO, which developed the mainframe end of the AppleLink software, was so impressed with AppleLink that the company adopted Macintosh hardware and software for its BusinessTalk product. The main difference between AppleLink and BusinessTalk is that Apple set up AppleTalk for its own dealers, developers, and others, while GEISCO is marketing BusinessTalk to the Fortune 1200 as a network that can be tailored to fit. GEISCO will help companies create their own proprietary networks, all functionally equivalent to AppleLink but dedicated to the individual companies' needs. GEISCO's first product under the umbrella of BusinessTalk was DealerTalk, aimed at companies that want to offer the service to their dealers.

Alma Rodoni, manager of dealer systems marketing for GEISCO in Rockville, Maryland, says a manufacturer would use DealerTalk much as Apple uses AppleLink—for such applications as E-mail, new product announcements, price updates, and updates to technical specifications. "The real benefit of the system is that information can be communicated immediately, accurately, and simultaneously throughout the channel," she says.

AppleLink is such a powerful idea that, according to Rodoni, GEISCO is working on a version for the IBM PC. Rodoni says the company will try to introduce that new product later this year.

Long-Term Links

Although it started as a service to Apple's employees and dealers, AppleLink is already evolving into Apple products for others. Apple is adding 900 hardware and software developers to the AppleLink, according

to Ellen Nold, Apple's manager for support programs, and Apple now has a pilot program to support user groups. In the works are a version for the Apple II and, as a long-term prospect, a product purely for consumers.

In January Apple announced a joint venture with MCI and Dow Jones. Sources close to Apple say that the joint marketing agreement with MCI and Dow Jones will produce a very powerful, simple-to-use E-mail package. The first AppleLink-based service to even approach the end user is a pilot program for user groups; Apple plans to get this program on-line this spring, according to Ellen Petry Leanse, Apple's user group "evangelist." Unfortunately, only user-group bulletin board administrators will actually have access to AppleLink. They will act as go-betweens for Apple and the users, screening users' questions and relaying answers from Apple.

The pilot program will involve 40 to 60 user groups, says Leanse, but the services to the user groups have yet to be determined. To start with, "We will at least give them access to technical libraries, Apple corporate press releases and product announcements, and direct access to user-group support at Apple," Leanse says. The pilot program will also provide a read-only bulletin board, she added.

John Zeisler, manager of business marketing for Apple, speculates, "Ideally you'd be able to walk into a retail store and buy a user kit, and maybe an administrator's kit." An administrator's kit would allow you to set up bulletin boards, add and delete users, and help build a database. The user kit would give the same kind of capability that AppleLink or BusinessTalk provides. The hope, Zeisler says, is "to let a small distributor who wants to communicate with 20 key customers have the same capability that Apple has or any of GEISCO's customers has."

Zeisler points out that because Apple owns the rights to the source code of the file server software that resides in GEISCO's mainframes, the potential exists to port AppleLink to other networks. "It's hard to speculate, but it could be transported to other systems with a moderate amount of work," he says.

Ellen Nold, Apple's manager of support programs, looks forward to a network for consumers.

AppleLink's easy interface opens doors for Peter Friedman and John Zeisler of Apple marketing.

According to Zeisler, Apple is committed to seeing that communications products work on the Macintosh family and, "most importantly, that they work with the same user interface whether you're communicating with Dow Jones, or a private network like the AppleLink network, or a vertical market database. There are no specific product plans, but obviously we believe that this is strategically a very important market for us."

Hoyt, Apple's chief architect of AppleLink, says Apple is working on an Apple II version of AppleLink to be aimed first at the education market.

Jan Lewis, industry analyst and president of Palo Alto Research Group, says that the exciting thing about AppleLink is that it offers the best of both worlds. Lewis expects that the new combination of a graphic human interface with networking will encourage tremendous growth at the consumer level. "We already had a healthy market before we tied into the human interface, and I think this will greatly expand the user base. We could be seeing the jumping-off point in telecommunications that people have been predicting for years," Lewis says.

With GEISCO hoping to bring out an IBM PC version of BusinessTalk sometime in 1986 and Apple adding programs for developers and user groups, by year's end we could see a raft of powerful new telecommunications programs, mostly for medium-size and large businesses. But by the time that the largest and most profitable markets are established, small-business and home users will clamor for the E-mail, technical support, and news service features of these systems. □

Tom Moran is a San Francisco-based writer who has published numerous articles on microcomputers, peripherals, and related topics.

It speaks for itself.

The Shanner Planner™
gives you and comes with:

- Storage for four disks -3½″ or 5¼″ (specify preference when ordering)
- 5 x 8″ Notepad - can also accommodate documentation up to 300 pages
- Pen and Pencil Compartment
- Ruler Slot
- Business Card Section
- 5 Year Calendar
- Full Function Memory Calculator
- Each Shanner Planner comes with either four 3½″ disks or four 5¼″ diskettes

The unique velcro locking system ensures that your important media and contents are safely secured in their compartments at all times.

Measuring approximately the size of a normal executive portfolio, The Shanner Planner will fit comfortably into any size attache or carrying case, and comes packaged in an attractive gift giving box.

The Shanner Planner™

$39.95

Dealer Inquiries Accepted
Call 800/828-6637

Remember the expression "A picture is worth a thousand words?" Take a second look. The Shanner Planner™ is the first ever full system portfolio created specifically for the computer user. Designed to address the individual needs of the computer industry, The Shanner Planner is tastefully constructed of long lasting, durable, textured nylon *(it's the in thing today)* to maintain its smart appearance over time.

SHANNER INTERNATIONAL CORP.

The Shanner Planner™ is a creation of, marketed worldwide by, and is a Trademark of SHANNER INTERNATIONAL CORP.

Please send me _____ Shanner Planner(s).

I am enclosing $ _____ .
(CA residents add $2.60 tax per Planner)
Please make check or money order payable to:
Shanner International Corp.
453 Ravendale Drive
Mountain View, CA 94030

Canadian Orders:
Canadian cost per Planner is $49.95.
(Ontario residents add $3.50 PST per Planner) Please direct orders to:
Shanner Sales & Marketing, Inc.
450 Garyray Drive
Weston, Ontario

Name _____

Address _____

City _____ State _____ Zip _____

For all orders: Please add $3.00 per Planner for shipping and handling. C.O.D.'s and purchase orders will not be accepted. Please allow 21 days for delivery.

Circle 499 on reader service card

Do You Think For A Living?

ENHANCE YOUR GENUINE INTELLIGENCE WITH...

- SYSTEMATIC PROCEDURES
- IDEA GENERATION AIDS
- DECISION MAKING AIDS
- TUTORS AND COACHES

...INTEGRATED INTO EXPERT SYSTEMS SOFTWARE FROM ODS, INC.

ods/CONSULTANT™—helps you use your whole brain to think and work more productively. Use it for problem solving, planning and developing persuasive presentations.

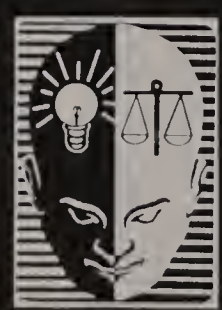
ods/SALES CONSULTANT™—helps you plan and make more sales. Use it to manage your time, market, accounts, calls, presentations, and professional development. New for '86!

ods/SOLUTION CENTER™—helps small groups meet, think and make decisions more productively. Use it with the board of directors or Quality Circles to manage meetings, solve problems and plan—the entire business or a process improvement. (Site licensed only to organizations and Consulting Dealers.)

Computer aided thinking is more than an art form.

SYSTEM	DEMO DISK*	FULL PROGRAM*
ods/CONSULTANT™	$15.00 + $2.00 S&H	$200.00 + $5.75 S&H ($300.00 after 7/1/86)
ods/SALES CONSULTANT™	$15.00 + $2.00 S&H	$300.00 + $5.75 S&H
ods/SOLUTION CENTER™	$25.00 + $3.00 S&H	By proposal only

*Available now for All Apple Macintosh Models



ODS, Inc.—Organization Development Solutions
1011 E. Touhy—Suite 535
Des Plaines, IL 60018
(312) 699-4156

ods/CONSULTANT, ods/SALES CONSULTANT, ods/SOLUTION CENTER and Solution Center are trademarks of ODS, Inc., Des Plaines, IL. Macintosh is a trademark licensed to McIntosh Laboratory, Inc. Copyright 1986 ODS, Inc. All rights reserved.

Circle 273 on reader service card

FANNY MAC™

INEXPENSIVE PROTECTION TO PROLONG THE LIFE OF YOUR MAC!
COOLS YOUR MAC BY 50 DEGREES OR MORE!

SURGE SUPRESSOR PROTECTS AGAINST POWER SPIKES!

INSTALLS OR REMOVES IN SECONDS — NO TOOLS REQUIRED!

USES A BALL BEARING FAN — VERY QUIET.

from BECK-TECH 800-227-2400 ext. 999

07361

Circle 494 on reader service card

We're in business with Macintosh Plus.

HOW TO ADD INCREDIBLE SPEED AND STORAGE TO THE MACINT PLUS

Introducing
HD-20™ and
HD-30™

The 20 megabyte and
30 megabyte Hard Disk
Drives for Macintosh Plus

Adding storage and speed to a Macintosh Plus is easy. Place the HD-20 or HD-30 under your Macintosh and save desk space. Connect the drive to the SCSI expansion port and you can transfer data 16 times faster than many current hard disks.

Turn it on and it automatically boots up. The HD-20 and HD-30 both support Apple's new Hierarchical File System, and they are expandable to add more memory devices or tape back-up units.

See MDIdeas' HD-20 and HD-30 at your authorized Apple Dealer and be sure to ask about Apple's "We're in Business with Macintosh Plus" promotion. During this promotion all purchasers of the HD-20 and HD-30 will receive a free booklet entitled, "Hard Disk Usage for the Macintosh" and free hard disk back-up software.

Offer expires 4/30/86.

HD-20–$1095 HD-30–$1595

MDIdeas, Inc.

1111 Triton Drive, #205
Foster City, CA 94404
(415) 573-0580

HD-20, HD-30, and MDIdeas are trademarks of MDIdeas, Inc. Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 467 on reader service card

Macware Reviews

PC MacBridge, Consultant, Fokker Triplane Flight Simulator, Hard Disk Util, The Housekeeper, Mouse Exchange BBS, and 4Paint

Edited by Erfert Nielson

Bridging the Gap

In the interest of furthering peaceful coexistence between Apple and IBM, Tangent Technologies recently released ***PC MacBridge,*** an add-on board for the IBM PC (and PC compatibles) that lets you attach the PC to the AppleTalk network and use it with Apple's LaserWriter. PC MacBridge comes with a collection of programs. LaserScript allows *WordStar, Multimate, 1-2-3,* and ASCII text files to be printed on the LaserWriter, giving PC owners access to the printer's powerful PostScript page description language. (While the IBM PC version of *Microsoft Word* already has the ability to produce PostScript output for the LaserWriter, PC MacBridge allows multiple PCs to share a LaserWriter using AppleTalk.) LaserGraph lets you create bar, pie, and line graphs on the LaserWriter. MailBox allows file transfer between the PC and other computers.

The PostScript Advantage

In addition to letting *WordStar, Multimate,* and *1-2-3* send output to the LaserWriter, the PC MacBridge software provides commands that take advantage of some of the features that make PostScript so attractive. For example, the *WordStar*-to-PostScript converter provides commands for selecting a typeface, printing super- and subscripts and strikeout type, justifying or centering lines, and printing characters other than the standard ASCII symbol set. Other commands let you select the dimensions of a page, set tabs for use with proportional fonts, change character size or line spacing, send new font-family definitions to the printer, insert graphs into text documents, and insert PostScript commands into text documents.

Placing PostScript commands in text documents enables you to easily insert graphics into a page of text. For example, using this feature you could create a small file containing the PostScript commands for printing a horizontal bar. Then, whenever you wanted to insert a bar into a document, you could simply specify the name of the file. Unfortunately, the PC-PostScript connection isn't flawless; for example, when converting *WordStar* files to PostScript, the PC MacBridge software doesn't change the location of *WordStar*'s line breaks. To justify the right margin, the conversion software adds spaces between words to make all lines the same length. This can result in text that is excessively "airy."

PC MacBridge gives you extra options for printing spreadsheets and can improve the appearance of business graphics. The PC MacBridge conversion program for *1-2-3* lets you print extrawide spreadsheets by using a small font and printing the spreadsheet in landscape (sideways) orientation. Laser printing is a real boon for *1-2-3* graphs; the LaserWriter's fonts make much more attractive graph labels than Lotus's fonts.

(continues on page 138)

SONY®

3½" SS DISKS ■ Boxed in tens

30+ $1.65 50+ $1.62 100+ $1.59

3½" DS DISKS ■ Boxed in tens 30+ $2.65 50+ $2.57 100+ $2.55

FREE! One VHS or BETA Sony blank tape with every 30 Sony boxed disks purchased from this ad.

THE MAC-PAK 3½" DISKS Packaged in 50's

*Sorry, free tapes not available with the Mac Pac.

$1.53 50+ ea. $1.48 100+ ea. $1.45 400+ ea.

maxell®

3½" SS DISKS ■ Boxed in tens

30+ $1.69 50+ $1.59 100+ $1.49

Packed in 50's

50+ $1.65 100+ $1.45 400+ $1.42

Nashua™

3½" SS DISKS Boxed in tens

30+ $1.55 50+ $1.47 100+ $1.39

THE MAC COMMANDER PERMA POWER®

Protection plus fingertip control for your Mac and up to four peripherals.

- Reduces RF and EMI noise interference
- Extended-life surge suppression
- Patented auto shut-off feature
- Five year warranty

$103.29

RIBBONS

APPLE IMAGEWRITER $3.09 each, qty. 6

Color 6 packs $4.09 each, qty. 6

(one each red, green, blue, brown, purple, yellow.)

ROLLTOPS

$17.49

This classic rolltop design holds up to 55 3½" disks. Has dividers, anti-skid feet.

Retails for $24.99.

CALL TOLL FREE 1 800 USA-FLEX

In Illinois 1 800 FOR-FLEX

7 to 7 Central Time
10 to 3 Saturdays

Shipping/handling additional. Minimum order $50.00. Visa, Mastercard and prepaid orders accepted. Corporations rated 3A2 or better and government accounts are accepted on a net 30 basis. C.O.D. orders add an additional $5.00 special handling charge. APO, FPO, AK, HI & PR orders add an additional 5% of the total order amount to cover PAL and insurance. Illinois residents add 6¼% tax.

USA FLEX

135 N. Brandon Drive Glendale Heights, IL 60139

Circle 134 on reader service card

(continued from page 137)

From PostScript to Postman

As if the features already mentioned were not enough, PC MacBridge moonlights at yet another job, opening up an electronic mail link over AppleTalk from PC to PC or from PC to Macintosh. The Macs must be running Videx's *Mail Center* electronic mail program; the PC end of things is taken care of by the PC MacBridge software.

A typical E-mail application might be the creation of a newsletter. After generating articles on a PC running *WordStar,* you could send text to a Macintosh, lay it out using Aldus's *PageMaker,* and then print the newsletter on the LaserWriter. Another example would be sending *1-2-3* spreadsheets to a Macintosh, where they could then be transferred to *Excel* or *Jazz.*

PC MacBridge's one drawback is the fact that it includes an enhancement board; the board isn't necessary for printing, since a PC can be connected to a LaserWriter using a standard serial cable. If you're interested only in laser printing and don't need electronic mail, you may want to save PC expansion slots for other boards. Anticipating this need, Tangent offers LaserScript/S, a version of LaserScript that lets you connect the PC directly to the LaserWriter with a serial cable.

Will the Apple LaserWriter, assisted by PC MacBridge, succeed on Big Blue's home turf—the large corporations? My hunch is that it will. The LaserWriter opens doors to professional-quality presentation graphics, near-typeset-quality documents, desktop publishing, and a wide variety of fonts—capabilities that many companies will find too good to pass up.—*Ted Nace*

PC MacBridge
Tangent Technologies
5720 Peachtree Pkwy. #100
Norcross, GA 30092
404/662-0366
List price: $650 including software, board only $350, LaserScript/S $250

Training Wheels for the Mind

If you work with your brain, a computer and the right software can help you perform tasks that would otherwise be difficult or impossible. Spreadsheets can help

(continues on page 142)

Given the Advantage . . .
Your Mac will RISE to the Occasion!

Seize the MacAdvantage for $79.95 and realize your Mac's potential.

MacAdvantage: UCSD Pascal operates directly under the Mac's operating system and Mac's own interface for program development. You can write programs that execute directly under the Mac's system and use virtually all the Mac ROM calls!

MacAdvantage includes:

UCSD Pascal Compiler

Supports an enhanced Pascal language designed specifically for accessing Macintosh ROM routines. Your application may include pull-down menus plus access to Desk Accessories, multiple Windows and Mouse routines. Our compiler generates extremely compact code and supports the separate compilation feature so you can write large programs on any Macintosh, from the 128K Mac to the top of the line.

Editor

A powerful mouse-based editor lets you alter existing text or create new files. Editing operations (Cut, Copy, Paste) are all performed with the mouse. You can even edit two files simultaneously and copy text from one file to another.

Debugger

A symbolic debugger steps you through your program instruction by instruction.

ROM Interface Units

For virtually all Macintosh ROM routines. These units allow you to create programs that use the Macintosh User Interface.

RMaker

A resource compiler that lets you take advantage of the Macintosh's powerful resource concept.

And now seize the further MacAdvantage:
Buy the MacAdvantage: 68000 Assembler for only $79.95!

Designed to be used with the MacAdvantage: UCSD Pascal®, the package includes a Linker program, a Code Mover utility for installing device drivers and desk accessories, a low-level debugger and set of definition files for interfacing to the Mac ROM and operating system.

UCSD Pascal - *the* original standard of Pascal programming excellence. The new leader in Pascal price/performance.

Circle 504 on reader service card

UCSD Pascal is a registered trademark of the Regents of U. of Ca.
MACINTOSH is a trademark of Apple Computer.

PECAN™

Please send me:

☐ The MacAdvantage: UCSD Pascal for $79.95.
☐ The MacAdvantage: 68000 Assembler for $79.95.
☐ Both products for $139.95.

Total amount (NYS add appropriate tax) _____

Payment by ☐ **VISA** ☐ **MC** ☐ **US Bank Check** ☐ **Bank Draft**

Card Number _____

Credit Card Expiration Date: _____ / _____

Mail to: Pecan Software Systems, Inc.
1410 39th Street
Brooklyn, NY 11218
ITT Telex No. 494 8910
CompuServe Code 76703, 500

CREDIT CARD ORDERS CALL
(718) 851-3100
1-800-63-PECAN
(NYS) 1-800-45-PECAN

Name _____

Shipping Address _____

City _____ State _____ Zip _____

Telephone _____

Call toll-free or enclose a check with this coupon to place an order. Please add $2.50 for shipping within the US. Foreign orders add $10 and make payment by bank draft payable in US dollars on US bank.
New York State residents add appropriate sales tax.

You've put your finger on 3 key reasons to subscribe...

1 SAVE OVER $23 A YEAR! Your subscription means handsome savings for you—almost 50% off the cover price.

2 GET THE MOST FROM YOUR MAC! Your money-saving subscription also insures a steady flow of the practical information you want—reviews of software and hardware you can rely on, new applications, techniques, and practical "how-to" tutorials.

3 GET THE MACWORLD GUARANTEE! We're so certain you'll get what you need—and more—from MACWORLD, we guarantee it! If for any reason you're not satisfied with MACWORLD, just let us know and we'll promptly refund the cost of your subscription for every unmailed issue.

MACWORLD
The Macintosh™ Magazine

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO.

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

Sign me up!

YES! Please send me *Macworld*, the Macintosh magazine.

- ☐ Payment enclosed
- ☐ Bill me later
- ☐ $24 for 1 year (12 monthly issues) SAVE EVEN MORE!
- ☐ $46 for 2 years (24 issues)

Name

Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in U.S. only. Offer expires December 31, 1986.

4A3H4

Save

$23.40

off the

~~$47.40~~

cover price

Subscribe Now

YES! Please send me *Macworld,* the Macintosh Magazine

☐ $24 for 1 year (12 monthly issues)

SAVE EVEN MORE!

☐ $46 for 2 years (24 issues)

☐ Payment enclosed ☐ Bill me later

Name

Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in U.S. only. Offer expires December 31, 1986.

4A3G6

MACWORLD

Order Now to Take Advantage of This Limited Time Offer!

VISA and MasterCard Accepted!

Call TOLL FREE: 800/972-3100

(in Nebraska 402/895-7284)

Subscribe Now

YES! Please send me *Macworld,* the Macintosh Magazine

☐ $24 for 1 year (12 monthly issues)

SAVE EVEN MORE!

☐ $46 for 2 years (24 issues)

☐ Payment enclosed ☐ Bill me later

Name

Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in U.S. only. Offer expires December 31, 1986.

4A3G6

MACWORLD

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666

512K Memory Upgrade

$169.00

PRICE INCLUDES:

PARTS

- 16 256K 150 nano-second DRAM chips (faster than Apple chips)
- 17 30mil gold plated, machine screw, open frame, 16 pin DIP sockets
- One 74F253 multiplexer (distributes high addresses to new memory)
- 4 metal film resistors, one glass capacitor (for multiplexer circuit)
- One custom M-512 ultra-small, double-sided, solder masked printed circuit board on 7 pin gold header (multiplexer mount)
- Fully socketed; No piggy-backs or jumper wires; Fan not required

SERVICE

- Expert labor, complete installation
- 120 Day Warranty, parts and labor
- **Software**: Ramdisk, Switcher, Switcher Manual, Memory Test, Disk Duplicator
- **Free Return Shipping**, 2nd day air, anywhere in United States (motherboard only)
- **Board Swap Only Upon Request**

Now, the highest quality upgrade in Silicon Valley is available to you at factory direct pricing. $169 includes a 120 day warranty, a Mac Doctor™ Program Disk (RamDisk, Switcher, Memory Test, Disk Duplicator), and **Free Return Shipping** 2nd day air anywhere in the United States (of a motherboard only). Now that's service! **Logic boards are swapped only upon request.** To upgrade, ship your Mac motherboard or your entire Mac with payment or request for COD. If system down-time is unacceptable to you, we can ship you a complete 512K motherboard and refund you an exchange credit when you send us your swapped 128K board. Or do it yourself with our **512K Kit: all parts, instructions, software, $99.** Call or write for Mac opening tools and instructions. Sony and Maxell disks available at cost plus 10% with any purchase. Walk-in upgrades in San Francisco area. University purchase order OK. Volume discount is available. Dealer inquiries welcome.

SEND YOUR BOARD WITH CHECK OR MONEY ORDER (CA RESIDENTS ADD 7% SALES TAX) TO:

Mac Doctor Electronics

405 Lytton Avenue, Suite One, Palo Alto, CA 94301

Phone Orders: (415) 321-3358

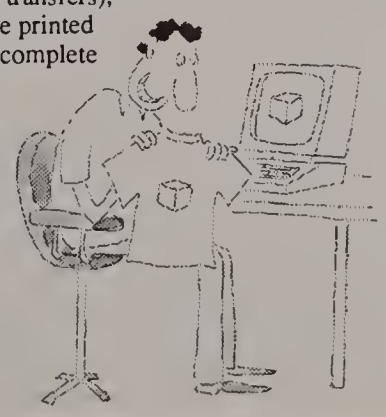
Circle 395 on reader service card

Colorful New Underware® Products!

Introducing Macintosh Color Printing Software
ColorPress 1 allows you to print multi-color images with the Imagewriter or Imagewriter II. With the new Imagewriter II, you can print with either multi-colored or separate colored ribbons. Designed specially for use with Underware Ribbons (to make iron-on transfers), ColorPress 1 has an option to reverse the entire printed image. Call for special Introductory offer and complete description. ColorPress 1 is $39.95.

New Multi-color Underware Ribbons
Four-color Underware Ribbons are now available for the Imagewriter II and Epson JX-80. The Imagewriter II ribbon is $29.95 (zip-box refill). The JX-80 ribbon is $34.95.

Underware Colorpack
The Underware Colorpack is an inexpensive way to add up to five colors to a T-shirt or fabric - all for only $24.95



Please call or write for our free brochure and a complete product/price list. Specify printer type when ordering.

UNDERWARE®

Diversions, Inc.
505 W. Olive Ave. #520, Sunnyvale, CA. 94086 408-245-7575

Circle 164 on reader service card

Apple Crisp?

Protect your Mac with the MacGard™ Surge Protector

- Eliminates both line-to-line and line-to-ground voltage surges and spikes
- Eliminates altered memory and data disruptions caused by static electricity
- Eliminates damage to hardware and software caused by faulty grounding in electrical outlets
- Eliminates scrambled monitor images caused by radio frequency interference
- Easy on/off fastening makes transporting your Mac easy
- 5-year warranty
- Available in computer stores everywhere or by calling **1-800-451-6866.** In Michigan call collect **906-774-0440.**

A product of:
Systems Control
A Division of M.J. Electric
North U.S. 2, P.O. Box 788
Iron Mountain, Michigan 49801

MacGard™

Circle 177 on reader service card

(continued from page 138)

with financial planning by giving instant numerical answers to "what-if" questions. Project management software can aid in planning and managing complex tasks by finding critical paths through PERT charts. *ThinkTank* provides flexible tools for organizing ideas in hierarchies. But as good as these software tools are, they're generally of little help with work that doesn't fall neatly into their areas of specialization. And then there's ***Consultant.***

A Generic Problem Solver

Consultant is a unique program for analyzing and solving problems. Designed by a team of—what else?—consultants, the program is a software encapsulation of time-honored principles of decision making, scientific inquiry, planning, problem solving, and selling. *Consultant* doesn't do the work for you; it simply provides thinking aids and problem-solving procedures. It's up to you to provide the relevant information, ideas, and final decisions.

Consultant aims to be a general-purpose problem-solving tool, and the developers recognize the fact that different kinds of problems lend themselves to different procedures. Menus represent a variety of approaches: Begin, for getting started; Detect, for doing detective work about past events; Discover, for applying the scientific method to a situation; Create, for creatively exploring future options; Plan, for building and following steps to a concrete goal; and Sell, for convincing others that you've come up with something worthwhile. Each menu contains a sequence of steps designed to solve the problem at hand. Using *Consultant* is simply a matter of choosing a menu and answering the questions posed by each step.

Icons Whispering in Your Ears

Because *Consultant* is designed to work with all kinds of problems, some of its questions may seem vague and difficult to apply to specific situations. Whenever you're stuck, you can check with the Tutor (represented by a mortarboard icon) to find out why *Consultant* is asking a particular question, or the Coach (baseball cap icon) for specific how-to help and examples.

Not all of the questions are easy to answer, so *Consultant* provides a number of thinking aids. On the left side of the screen are icons for four idea-generation aids: Brainstormer, for spewing forth ideas; Questioner, for answering questions; Combiner, for mixing and matching ideas; and Scenario, for telling stories. On the other side of the screen are the analytic decision-making aids: Prioritizer, for ranking items; Grader, for assigning a score of 0 to 10; Rater, for grading items based on two equal criteria, such as validity and relevancy; Evaluator, for weighing options with multiple criteria; Relater, for determining interdependencies that govern which things must be done before other things can happen; and Categorizer, for grouping items. If you feel overwhelmed by icons, you can click icons at the top of the screen to see a written summary of the aids below.

It's time for all smaller businesses

Open Systems introduces Open For Business.™ Accounting software solutions designed to fit the needs of small to very small businesses.

Until now, smaller businesses either settled for manual bookkeeping systems or costly service bureaus. Not any more. Now there's Open For Business I and II.

Open For Business I is the ideal entry level software package.

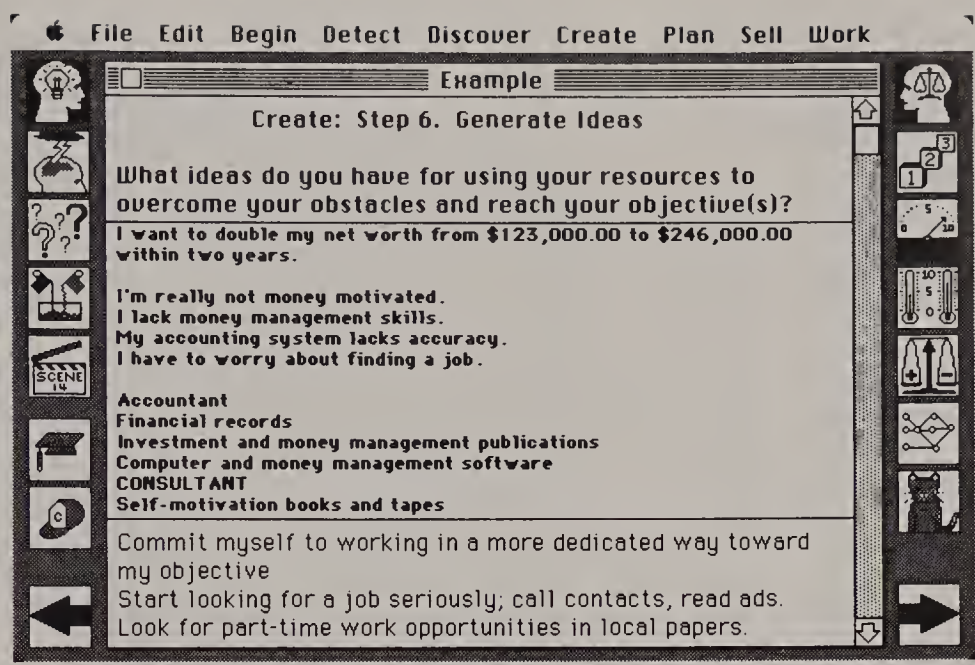
Open For Business II is the software package specially designed for small companies with somewhat larger needs.

Both Open For Business products provide key business indicators that have never been readily available to the smaller

The Consultant Is In

Consultant has a wide variety of applications. I spoke with a free-lance photographer who uses it for thinking up marketing strategies, planning exhibits, and generally providing creative nudges. A financial planner uses the program to define the markets he wants to penetrate, and a CEO of a small corporation brainstorms with *Consultant* for sources of capital.

I applied *Consultant* to several problems of my own, including that classic, "Too many things to do and not enough time to do them." When the program asked me for my "mission," I found myself looking for an overall goal that could justify being so busy, which forced me to see the problem from a slightly different point of view. The program asked me to choose the appropriate procedure for my problem, and I chose Create. The procedure led me through several time-consuming steps that involved making lists: pertinent facts, objectives, obstacles, resources, and ideas for using resources to overcome obstacles (see "What's Your Problem?").



What's Your Problem?
Consultant *provides a wide range of problem-solving aids that help you define the problem at hand, establish a goal, list the resources at your disposal, establish priorities, and arrive at possible solutions.*

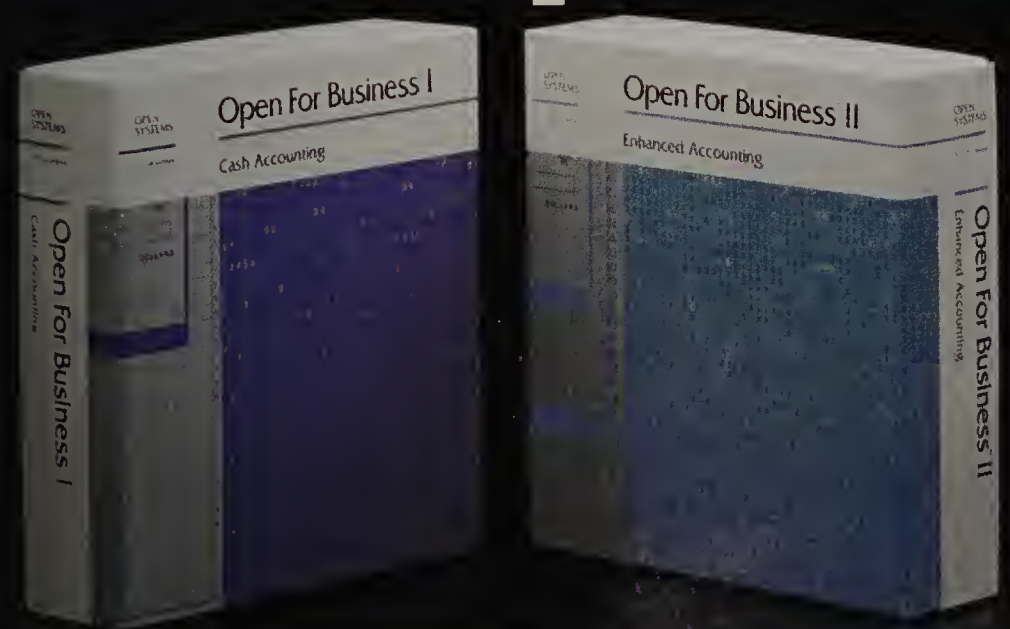
Some of the analytic tools proved helpful here—especially Prioritizer and Evaluator. These tools forced me to break difficult questions into simpler questions that almost answered themselves. When I finally reached the last step in the process, I saw that several of the "critical" items on my must-do list didn't seem important at all when considered as part of the big picture. But I wasn't surprised; I'd figured that out while working through the steps.

The Final Decision

I like *Consultant,* but I doubt that I'll use it much. After years of training and experience with problem-solving methodology, I find that the program doesn't do much that I can't do faster or more thor-

(continues on page 144)

to stand up and be accounted.



usiness before. Now, for the first me, you can actually measure ne "health" of your enterprise t a glance; receive immediate tatus reports of current sales nd expenses; and even generate raphic displays of specific sales nd expense reports.

And of course, both Open For Business products are backed by Open Systems, whose reputation for unsurpassed quality and client support has set new industry standards.

So stand up and be accounted. Call **1-800-328-2276** right now.

OPEN SYSTEMS™
BUSINESS AND ACCOUNTING SOFTWARE
6477 City West Parkway,
Minneapolis, MN 55344

A UCCEL Company

Circle 436 on reader service card

THE NEW PLUS SERIES™

Quality, Versatility, and Protection for your MacPlus™

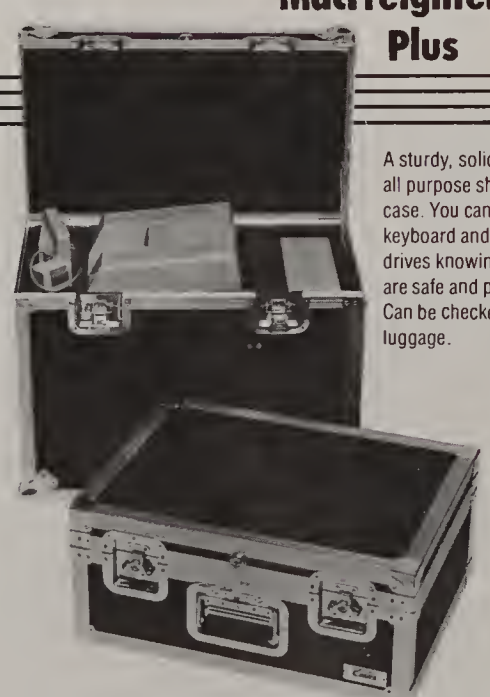
MacPlus Bag

Soft protective, easy to carry bag for new keyboard and external hard disc drive with room for a second disc drive.

PrintPak™ II

Take your printer along, with this soft protective bag; made especially for the new Image Writer II.

MacFreighter™ Plus



A sturdy, solidly built, all purpose shipping case. You can tote your keyboard and disc drives knowing they are safe and protected. Can be checked as luggage.

MacCovers,™ MacPak, and MacCase™ are now available for the Plus Series.

FOR ADDITIONAL INFORMATION PLEASE CALL TOLL FREE

1-800-228-7042

Quality Products From

LINEBACKER

643 Industry Drive Seattle, Washington 98188
(206) 575-1180

Circle 28 on reader service card

(continued from page 143)

oughly in some other way. For brainstorming, I'm more comfortable with *Think-Tank*'s blank slate approach than with *Consultant*'s incessant questioning. For quantitative decision making, I like to set up models I can see and change using *Excel*. While *Consultant*'s systematic approach did help me view certain problems in a new light, $200 is a steep price for a personal problem-solving aid.

If I managed an organization, though, I'd almost certainly spend some of my training budget on a copy of this program and encourage my employees to try it. While *Consultant* doesn't provide as much personal attention as a workshop or a human consultant, its interactive nature makes it easier to use than any of the how-to books that cover the same ground. The program could prove useful when used periodically to keep committees and other groups focused on particular goals. But like a relaxation tape or a weight-loss clinic, *Consultant* may prove most valuable when it's returned to the shelf because the skills it teaches have become second nature.—*George Beekman*

Consultant, Version 1.6
ODS, Inc.
1011 E. Touhy Ave. #535
Des Plaines, IL 60018
312/699-4156
List price: $200

Meanwhile, in the Skies over France . . .

You're flying deep behind enemy lines and have just spotted a signal from one of your spies. You're low on fuel, but you know the signal means he's captured important documents. It's up to you to retrieve them. You throw caution to the wind—and your aircraft into a steep, diving turn, preparing to land and rendezvous. But a quick look to the rear reveals that the enemy is closing fast on your tail!

What now, von Richthofen? You can either continue with your landing, hoping to evade the enemy, engage him in a fierce aerial dogfight, or . . . hit the pause button, think it over for a while, and resume combat once your jangled nerves have settled. This is not World War I, but 1986, and you're seated at the controls of ***Fokker Triplane Flight Simulator,*** a new offering from PBI Software.

By the time you find yourself in the situation just described, you will have logged a few hours in the Fokker, for the program is a flight simulator first and a challenging

(continues on page 146)

COLOR YOUR MAC

ColorPrint™ Software
- Color graphics for Imagewriter II
- Compatible with MacPaint™ & MacDraw™
- Over 60 color combinations • Also available for Imagewriter I

ColorChart™ Software
- Stand alone color business graphics for Imagewriter II
- 100+ charts & graphs
- Runs on 128K Mac™, 512K Mac & Mac Plus
- More powerful than any other Macintosh Chart program

Four color Imagewriter II ribbons available.

Color Software Priced Light As A Feather
ColorPrint™ $29.95 / ColorChart™ $39.95

I/O DESIGN & ESOFT ENTERPRISES
P.O. Box 272 Rumson, NJ 07760
To order or request information see your local dealer or call us today:
1-800-241-2122, in New Jersey 201-747-0943

We accept VISA, MasterCard or personal checks.

All trademarks acknowledged. Simulated artwork based on ColorPrint™ & ColorChart™ capabilities.

Circle 477 on reader service card

MacAttire™

"What the well dressed Mac is wearing."

Environmental Software Company

New!
Macintosh Plus, Macintosh HD & Imagewriter II.

AppleSkins™ ..... IIc, IIe, & peripheral.

P-Coat™ ..... IBM PC, XT, AT & peripheral.

Dusters™ .... AT&T, Epson, Okidata & more.

- 100% rip-stop nylon covers.
- Anti-static, waterproof, fire retardant coating.
- Three colors available: Burgandy, Navy, Grey

Dealer Inquiries Welcome

Western Distribution
Environmental Software Co.
PO Box 916
Glenwood Springs, CO 81602
Collect 303/945-0366

Eastern Distribution
I/O Design
PO Box 272
Rumson, NJ 07760
1/800/241-2122

Circle 506 on reader service card

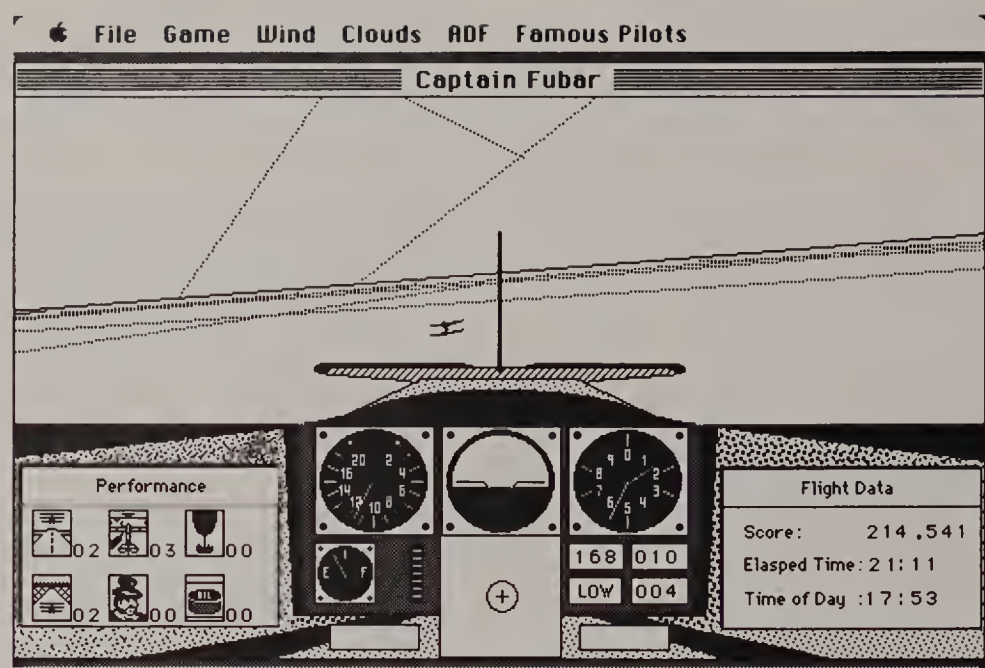
(continued from page 144)

game second. Before you start earning medals, you've got to learn to fly your crate. If you're put off by the program's 46-page manual, you can begin with Quick Flying Instructions, a short course that lets you get the craft airborne immediately. Once you tire of crashing every time you get near the ground, you'll want to proceed to Ground School and Flight School.

Fancies of Flight

As a flight simulator, *Fokker Triplane* is surprisingly realistic. As in a real airplane, engine sound varies when power is added or reduced or when the aircraft climbs or descends. To further increase the sense of reality, factors such as wind direction and cloud ceiling can be adjusted to create challenging flying conditions.

You use the mouse as the control stick to climb, descend, or turn. Throttle and rudder controls are simulated on the keyboard. You scan the horizon for enemy aircraft by pressing keys that let you look left, right, or over your shoulder (see "Enemy at Six O'clock"). Cockpit instruments are nicely detailed, highly responsive, and realistic in their operation—although the panel takes more than a little historical license (if Baron von Richthofen had had digital readouts and sophisticated radio navigation, we'd all be speaking German today). The graphics depicting the world outside the plane are less detailed but more than adequate, adjusting constantly as you slip through the skies.



Enemy at Six O'clock
Fokker Triplane*'s pilot can look to the left, right, or rear of the plane. (In a rare deviation from the program's realistic simulation, the control panel always remains in view.) Here, the enemy is in hot pursuit and immediate evasive action is required.*

Into the Breach

After a successful landing or two and a cross-country trip to one of four friendly bases, you'll lust for the taste of combat. If you think you're already an accomplished aviator, beware; danger awaits in the skies above. Choosing Armed vs. Unarmed from the Game menu gives you the advantage of ammunition while your enemy has none.

(continues on page 148)

Pascal for the Mac! Only $99.95

The MacLanguage Series™ Pascal compiler.

The first native code Pascal compiler for the Macintosh!

- Creates double-clickable applications
- Creates desk accessories

Now used in Apple's Mac High School, Dartmouth College and several other major universities!

Complete access to:

- Quickdraw
- Toolbox
- Operating System
- Printing
- Packages
- Serial Drivers
- Fixed-point Math
- 3D QuickDraw
- MacinTalk speech synthesis
- AppleTalk network
- HFS
- Built in compiler support for all SANE floating point types

Versatile:

- Compiles Lisa Pascal programs
- Compiles MacPascal programs
- Integrate MDS assembly routines

Works with:

- 512K Mac, Mac XL or Mac Plus
- Hard Disks including HD20
- Extended Memory
- HFS (Finder 5.x)

Three Compilation Modes:

- Compile to Object code (MDS .Rel files)
- Compile to Assembly source code (MDS .Asm files)
- Check Syntax only of a program

And now TML Systems introduces: MacLanguage Series Development Tools

MacLanguage Series Linker/Librarian	$59.95
MacLanguage Series Database Toolkit	$89.95
MiniEdit for MacLanguage Series Pascal	$19.95
MacExpress™ for Pascal from Alsoft	$495.00

TML Systems

PO Box 361626, Melbourne, FL 32936 (305) 242-1873 Please enclose $5.00 shipping and handling with all orders

Circle 471 on reader service card

DataSpace
corporation

Data Space makes Sense

DataSpace brings together all the components you were promised for your Macintosh™ office of the future.
The DataSpace MAX printer buffer is more than just a buffer. Connected to the AppleTalk™ network it acts as a printer server, allowing up to 31 Macintoshes to share a single printer. The MAX can handle several print jobs from different Macintoshes. This means the MAX can continue to accept print data from one Macintosh, while another document is still being printed.
The DS800, our 800K external disk drive simply plugs into your 128,512 or Macintosh Plus. No software or modifications are required! Its quiet operation makes it a perfect companion for your Macintosh.

Now you can make sense out of your Macintosh office. Visit your local Apple dealer for a demonstration today, or call us directly on our toll free number.

DataSpace
corporation
205 Riviera Drive, Markham Canada L3R 2L6
(416) 474-0113 1-800-387-0492

Macintosh is a trademark licensed to Apple Computer Inc.
AppleTalk is a trademark of Apple Computer Inc.
DataSpace is a trademark of DataSpace Corporation

Dealers Circle 497 on reader service card

End users Circle 354 on reader service card

(continued from page 146)

But the enemy is tenacious and will run into you, knocking you out of the sky despite his lack of armaments. Following a dozen or so such incidents, you'll find yourself going back to the manual to learn the daring aerobatics taught in the Military Training section.

Your missions will be many and varied. To earn your wings, you must shoot down enemy balloons, destroy fuel depots at enemy bases, fly under bridges, and retrieve documents from spies hidden deep in enemy territory. You must also keep a careful eye on fuel and ammunition levels and navigate back to a friendly base to refuel or reload when either gets low. All the while you'll be tormented by enemy aircraft, which you must either evade or fight.

Patience and Skill

The difficult task of mastering the aircraft is what I like best about *Fokker Triplane*. Although I'm an experienced pilot, it took me several flights to get the feel of the Fokker. While the manual makes it clear that this program can't teach you to fly a real airplane, *Fokker Triplane* is a realistic simulation and demands considerable flight proficiency before you can engage the enemy in anything but a foolhardy suicide mission.

A jaded pilot once defined flying as hours of sheer boredom, punctuated by moments of sheer terror. *Fokker Triplane* succeeds as a flight simulator because it approximates both of these extremes, from the monotony of a long, cross-country flight to the white-knuckled anxiety of flying in the clouds, evading another plane, or simply lining up for your first landing. *Fokker Triplane* succeeds as a game because it is realistic and exciting and because it places you in a multitude of perilous situations. If you prefer a game that allows you to start blasting the enemy out of the sky immediately—and which will bore you almost as fast—there are many available. But if you like a challenge and don't mind learning a little something along the way, I highly recommend *Fokker Triplane Flight Simulator.—Walter C. Burns*

Fokker Triplane Flight Simulator
PBI Software, Inc.
1111 Triton Dr. #201
Foster City, CA 94404
415/349-8765
List price: $59.95

Hard Disks Made Easy

Most Macintosh software developers have chosen copy-protection schemes that require hard disk drive owners to insert a master disk before a program can be run. This method ensures that the user has the original master disk, which contains a special key, such as an invisible file or a nonstandard sector. While it's understandable that software companies want to foil illegal copying of their products, legitimate software owners soon grow tired of irksome requests to insert master disks whenever they run copy-protected programs from hard disks or RAM disks. ***Hard Disk Util,*** from FWB Software, allows you to use copy-protected programs without first inserting a master disk.

Although sophisticated bit copiers like *Copy II Mac* and *MacBackup* also allow you to back up copy-protected disks, the copies they make are exact duplicates that retain the copy-protection scheme of the original master disk. HDUtil, *Hard Disk*

(continues on page 150)

MacBuffer™

The First Print Buffer System for the Macintosh that Really Works, Saves Time, and is Available Now.

Tired of your Mac waiting for the Imagewriter throughout the day? MacBuffer is the solution that works. MacBuffer controls the printer leaving the Mac free to use. MacBuffer's 256K, 512K, or 1 Megabyte of memory, and a super fast data transfer rate can improve your productivity up to 400%. MacBuffer comes with all cables, ready to install. Other features include:

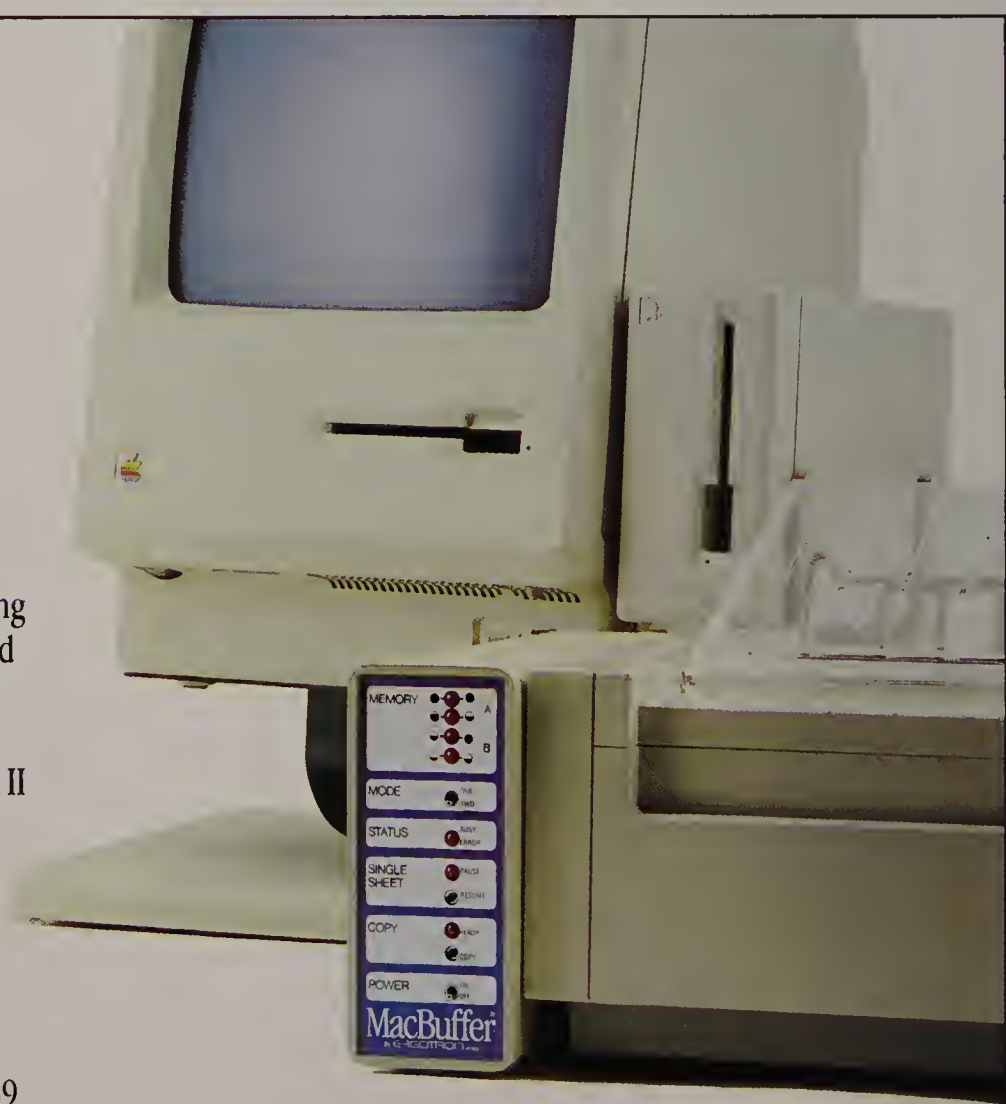
- Compatible with existing Macintosh software and Imagewriter I and II
- Two Macs can share one MacBuffer and printer
- Local Copy and Single Sheet Modes.

Based on either price or performance, MacBuffer is unequalled. For more information see your local Apple dealer or contact Ergotron, Inc.

ERGOTRON inc

P.O. Box 17013 • Mpls., MN 55417 • (612) 854-9116 • 800/328-9839

Ergotron and MacBuffer are trademarks of Ergotron, Inc.

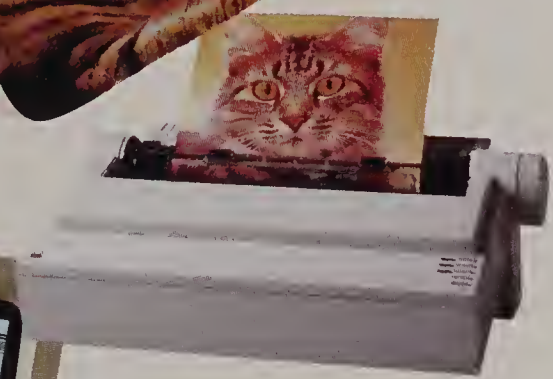


Circle 83 on reader service card

THERE'S MORE THAN ONE WAY TO SCAN A CAT

When you want to create graphics with your Macintosh, there's no need to pussyfoot around with anything less than ThunderScan. Because ThunderScan® turns any printed image into a detailed, high resolution Macintosh graphic. Then lets you change and enhance the image any way you wish. With a powerful set of software tools, written by Mac developer, Andy Hertzfeld.

CAT *(AKA Kitty)*
Start with any original image, black & white or color, up to 14" wide (with a wide-carriage ImageWriter).



FEED THE KITTY
Feed it into any ImageWriter (I, II, or wide-carriage). ThunderScan simply replaces ImageWriter's ribbon cartridge, so you don't need a video camera.

CAT SCAN
Now ThunderScan is zipping back and forth, digitizing the image at up to 288 dots per inch, in 32 shades of gray.

CAT & MOUSE
With mouse in hand you have micro-control of the contrast, brightness and half-toning. Over all or selected parts of the image. You can scroll, erase, cut, paste, draw...

CAT'S EYE
...enlarge or reduce...

CAT PRINTS
...then print out your finished work on your ImageWriter or LaserWriter. ThunderScan taps the full resolution of LaserWriter, producing exquisite graphics with up to 300 dots per inch.

CATALOG
Cut and paste scanned images into catalogs, newsletters, reports, correspondence, personalized cards and more. ThunderScan works great with page layout software, adding high-quality graphics to your publications.

CAT CALL
You can even send images from Mac to Mac by modem.

So you see, there are as many ways to scan a cat as you can imagine. As long as you have ThunderScan. Just $229 complete. See your Macintosh dealer or contact us.

Thunderware,® Inc.
21 Orinda Way
Orinda, CA 94563
(415) 254-6581

ThunderScan

Circle 167 on reader service card

ThunderScan, as shipped, is compatible with the 128K or 512K Macintosh, ImageWriter I & II and LaserWriter. Compatibility with the wide-carriage ImageWriter and Mac Plus requires accessories. Contact us directly for answers to your compatibility questions.

Mac, ImageWriter and LaserWriter are trademarks of Apple Computer Inc. Macintosh is a trademark licensed to Apple Computer, Inc. ThunderScan, Thunderware, and the Thunderware logo are registered trademarks of Thunderware, Inc. © 1986 Thunderware, Inc.

NOW YOU CAN KICK YOUR MONSTERMAC™ OR MACINTOSH PLUS™ INTO *OVERDRIVE*™.

LEVCO'S *OVERDRIVE* HARD DISK SUBSYSTEM.

Combined with Apple's Macintosh Plus or Levco's MonsterMac 2 meg upgrade, *OverDrive* 20 megabyte hard disk system transforms your Macintosh into a powerful, professional work station. Finally, Macintosh owners can have an internal hard disk system that is intelligent, speedy, convenient and reliable.

MACINTOSH PLUS COMPATIBLE

With the introduction of the Macintosh Plus, Apple defined Small Computer Systems Interface (SCSI) as the standard for high-speed Macintosh peripherals such as hard disk drives. Levco is committed to this standard, and has engineered the *OverDrive* hard disk system to optimize the new Macintosh technology.

With *OverDrive*, your Macintosh will automatically boot without floppies by using the HFS system built into the Apple 128K ROMs. The system supports multiple partitions, and includes software utilities for disk management. Since the *OverDrive* SCSI port is functionally identical to that on the Macintosh Plus, generic SCSI utilities and hardware will operate without modification.

Levco offers everything you need to kick your Macintosh into OverDrive and into a world of higher performance.

Levco
6160 Lusk Blvd.
Suite C-203
San Diego, CA 92121
(619) 457-2011

SAVE $75.00! KICK YOUR MACINTOSH INTO *OVERDRIVE* TODAY!

Levco is offering a $75 rebate for those who wish to kick their MonsterMac or Mac Plus into *OverDrive* before October 31, 1986. Just send this coupon to Levco with your written order for an *OverDrive*, or bring the coupon to a participating authorized Levco dealer for an installed *OverDrive* 20 Megabyte internal hard drive system. Call Levco for the participating dealers in your area.

Customer Use
Name: _____
Company: _____
Address: _____
_____
Phone: _____

Levco Use
Dealer: _____
Installation Date: _____
MonsterBoard Serial Number: _____
Mac Motherboard Serial Number: _____

Mail completed coupon to: Levco 6160 Lusk Blvd. Suite C-203, San Diego, CA 92121
Offer void where prohibited by law. One coupon per customer.

MonsterMac and OverDrive are trademarks of Levco. Macintosh and Macintosh Plus are trademarks licensed to Apple Computer, Inc.

Circle 493 on reader service card

(continued from page 148)

Util's main program, takes an entirely different approach. Instead of copying whatever file or sector oddities the various protection schemes look for, HDUtil simply alters programs so that they won't look for the copy-protection key. Programs altered, or "patched," in this manner won't ask for a master disk when they're run from a hard disk, a RAM disk, or for that matter a floppy disk. In short, once patched by HDUtil, a program can be copied from one disk to another using only the Finder.

Mastering HDUtil

The first step in circumventing copy protection is to copy the original master disk to another floppy using the sector copier provided with *Hard Disk Util.* You begin this way for two reasons. First, it's not wise to alter the master disk. Second, the copy produced is exactly like the original except it doesn't contain nonstandard sectors or any other oddities the original disk might have had. Because the abnormalities can't be written to hard disks or RAM disks, HDUtil is then used to alter the program on the copied disk so it won't look for the abnormal sectors. Once patched, programs can be copied to either type of disk using the Finder. HDUtil also lets you copy and delete files, verify disks, and change a file's attributes.

One drawback to HDUtil's approach is that in order to install a copy-protected program onto a hard disk, the utility must both recognize the program and know exactly how to modify it. This information is stored in individual patch files that contain the identity and location of the code that must be changed. FWB Software is continually developing and updating patch files, and patches for nearly 80 programs were present on the disk I reviewed in January. Although many games are included in this list, patches for popular business programs are included too. Since programs are modified by HDUtil on a case-by-case basis, you'll need a patch file for each program you want to install. Contact FWB Software for information on specific programs.

Using a different patch file for each program to be copied may sound like the fast lane to obsolescence, but it is actually one of the more innovative aspects of *Hard Disk Util.* Because the information to remove the copy protection from new or updated programs is contained solely in

(continues on page 152)

IT'S SIMPLE TO SAMPLE

ONE-WRITE ACCOUNTING ON THE MAC

For only $19.95, you can sample a full working copy* of Plains & Simple,™ from Great Plains Software. Within minutes you'll see how easy it is to computerize your accounting.

If you already use a one-write or pegboard accounting system, then you already know how to use Plains & Simple. Our program is customized for over 25 different kinds of businesses, from services to real estate, and from doctors' offices to hotel management.

Just call us at 1-800-345-3276 to order your full working sample of Plains & Simple.

*Includes complete general ledger, accounts receivable and accounts payable limited by number of transactions only.

GREAT PLAINS SOFTWARE®

GROW YOUR BUSINESS ON GREAT PLAINS™

© 1986 GREAT PLAINS SOFTWARE, INC.

Circle 473 on reader service card

(continued from page 150)

tiny patch files, there's no need to continually update the HDUtil application itself, only the patches. FWB Software plans to release an additional disk with more patches every three to four months for $10 to $20. If you don't want to wait a few months for updates, the manual gives information on a bulletin board system that provides HDUtil patches.

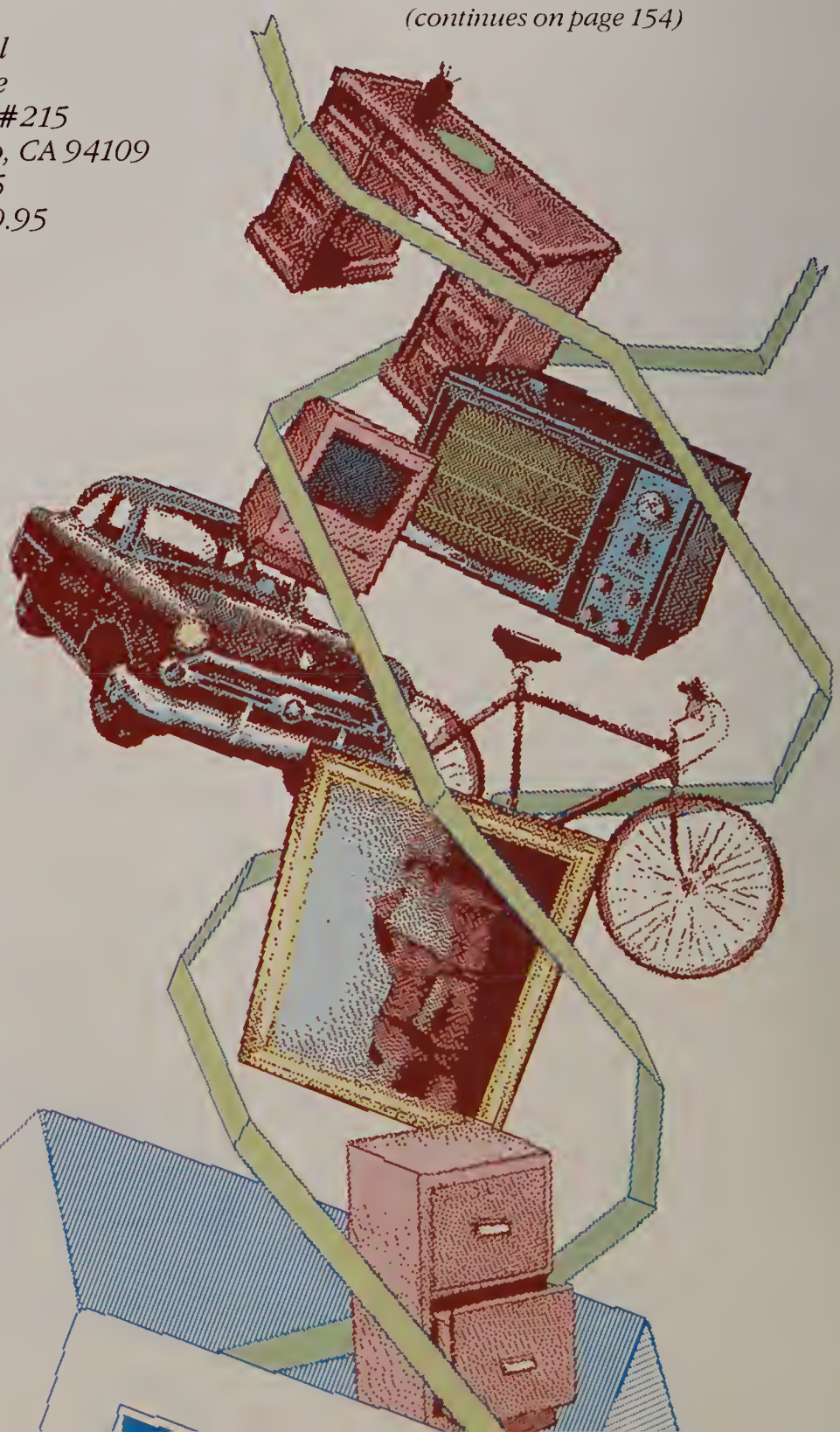
As the *Hard Disk Util* manual states, copy protection is a controversial issue. Many software developers have chosen copy protection as a means of reducing the number of illegal copies made. Unfortunately, this scheme limits the speed and convenience of a hard disk by requiring that master disks always be at hand. It's hard to imagine how anyone who owns a hard disk drive or a large memory upgrade could resist the appeal of never again seeing another dialog box pleading "Please Insert the Master Disk."—*David Foster*

Hard Disk Util
FWB Software
2040 Polk St. #215
San Francisco, CA 94109
415/474-8055
List price: $89.95

It Does Do Windows

You may be using one of the many Macintosh desktop organizers to keep your office affairs in order, but chances are your records at home are stuffed into folders, boxes, and drawers. ***The Housekeeper,*** a home inventory system from Aegis Development, provides an easy way to keep track of personal property. *Housekeeper* is a mini-database into which you enter information about your possessions, such as the purchase date, the cost, and the serial number. You can then use the program to calculate your expenditures by category or to generate police and insurance reports should the goods be stolen or damaged. The program is so compact (17K) that it works well even on a bare-bones 128K Macintosh with one disk drive. (An Aegis representative told me that version 2.0, which works on a 512K Mac or a Mac Plus and is faster than the earlier release, is available

(continues on page 154)



New!
Mac Video
On Any TV!

Mac Video Converter
Mac Video In - TV Video Out

Converts Macintosh video to standard TV video. Lets you use ANY TV or Big Screen Projection Unit as a Mac screen. Or record on a VCR.

Perfect for training presentations, sales presentations, or education.

Pan/Zoom (1:1 to 16:1) with smooth scrolling using your mouse!

No expensive special monitor or special projection unit is required. Attaches easily and is all you need to connect to A*ny* TV, Big Screen or VCR with direct video connector, or use with an RF modulator.

AFFORDABLE! All other video adaptors for the Mac require special monitors and special projectors that cost up to $4000.
Mac Video Converter for **$995.** and any standard TV device is all you need!

MultiVideo
INCORPORATED

4 Johnston Way, Scotts Valley, CA 95066
408-438-3663 Tlx: 6502821601 MCI
VISA, MC OK. Dealer inquiries Invited.
NTSC, RGB, PAL, SECAM Available.
Macintosh™ — Apple Computer Inc.

Circle 495 on reader service card

INTERNATIONAL APPLE CORE

Now that you have the computer for the rest of us, do yourself another favor. Read this ad.

Like most Macintosh™ users, you probably don't realize the many benefits of the International Apple Core.™ Or what we can do for you and your Mac.

The International Apple Core is a nonprofit organization of Apple users and user groups. We're just like your Macintosh, friendly and helpful.

We're dedicated to providing education, information and support to users of Macintosh and Apple products.

You can enjoy all the special benefits we have been providing user groups since 1979. You may share information on new applications. Or learn the latest on Macintosh products. Or keep up on Apple events.

If you'd like to join a local user group or contact other Macintosh enthusiasts, we can help.

A membership that pays you.

Our individual membership brings you discounts on public domain software, computer insurance, Micro Disk Minder™ and Penta Pac™ to keep your 3.5s in order, and a subscription to MACWORLD. If you have a subscription now, it will be extended for twelve issues.

You'll receive all this and more for only $30 yearly membership fee.*

If you get together with other Macintosh owners, you're on your way to forming a user group. And that's good. Because you can benefit even further from the IAC.

Our user group membership includes a subscription to MACWORLD, plus group purchases at bigger discounts. All the benefits of an individual membership and more. For not much more. Just $45 yearly.*

If you've considered forming a user group, you'll want our Club Management Binder. For only $35 you receive sample bylaws, ideas on forming and running your group, and electing officers and directors. All enclosed in a hard bound ring binder with two disks.

Individually or as a group you can't lose. So fill out the membership coupon below. And do yourself another favor.

INTERNATIONAL APPLE CORE™

Micro Disk Minder and Penta Pac are trademarks of International Datawares, Inc.

Apple and Apple II are registered trademarks of Apple Computer, Inc.

*Membership prices are for the United States and Canada only.

© 1986 International Apple Core

Macintosh is a trademark licensed to Apple Computer, Inc.

I want more for me and my Mac. Please see my choice below:

- ☐ $30 Individual Membership (US, Canada)
- ☐ $45 User Group Membership (US, Canada)

International Memberships

- ☐ $100 Individual Membership
- ☐ $125 User Group Membership

(These include airmail postage for MACWORLD.)

- ☐ $35 Club Management Binder
- ☐ I'm already a Macworld subscriber, please extend my subscription.

- ☐ Payment enclosed (U.S. funds only)
- ☐ VISA ☐ MasterCard

Charge Card No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Interbank No. ☐☐☐☐ Expiration Date ☐☐ MO ☐☐ DAY ☐☐ YEAR

Signature

Name

Address

City

State/Zip Country

Mail to:
International Apple Core
Dept. MAC-1
2279 Trade Zone Blvd.
San Jose, CA 95131

ASK ABOUT OUR FREE SHIPPING VIA FED EXPRESS

FOR RENT

TRY BEFORE YOU BUY

MANUALS INCLUDED

Rental Applies to Purchase

	RENT	SELL
DejaVu	10.50	33.00
Easy3D	17.85	62.40
Excel	58.25	237.00
Filemaker	29.25	117.00
Fokker	11.95	39.50
Gato	9.95	31.50
Helix	58.25	237.00
Mac3D	32.25	117.00
Macdraft	38.85	143.50
MacSpell+	16.25	59.40
MS Basic	23.25	90.00
MS Fortran	47.25	177.00
Omnis 3	71.75	297.00
Overvue	43.75	177.00
Wizardry	10.95	39.85
Thunderscan	37.75	175.00
Smartmodem		359.00
Haba &Mirror		349.00

Sony SS/ $1.65
Disks DS/ $2.50
Ribbons 6-Pak
Black $19.95
Color $23.95

MacRentals™
P.O. Box 6093 • Kingwood, TX 77325
Order Hotline:
1-800-972-3018
(713) 360-4649

Circle 368 on reader service card

(continued from page 152)

free of charge to registered owners.) Information on up to 500 items can be stored on the program disk. An inventory of up to 2000 items can be stored on a single document disk.

Housekeeper is easy to use, even for someone with no previous database experience. The documentation includes step-by-step instructions that walk you through all of the program's features. The manual even covers what to do if your Mac is stolen: retrieve a backup disk from your safe-deposit box and borrow a friend's Mac to generate police and insurance reports.

Name, Room, and Serial Number

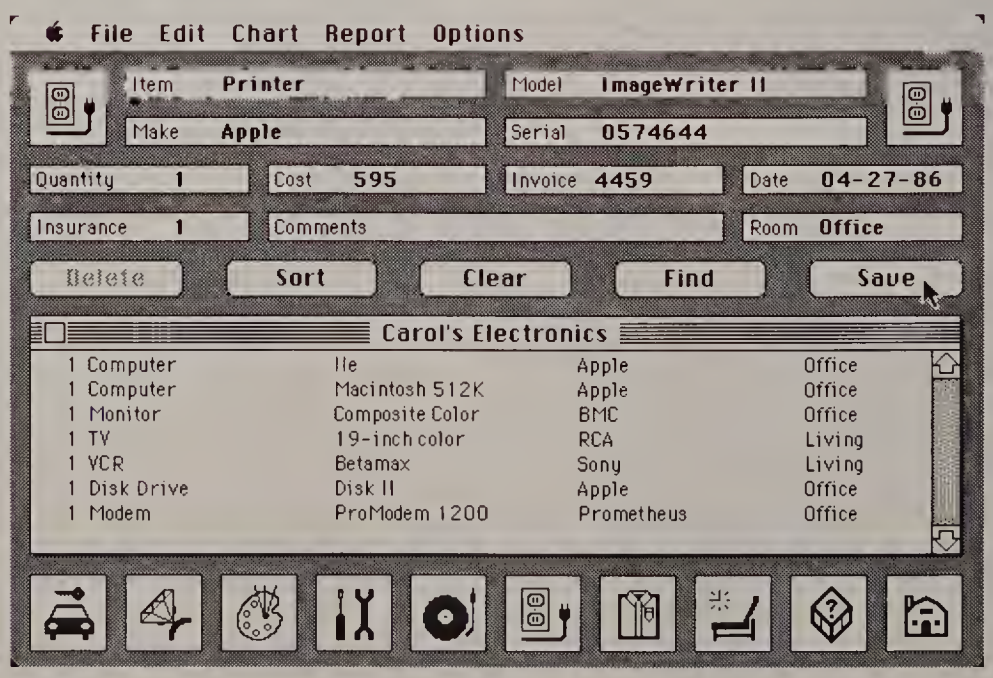
To enter an item into the inventory, first select the appropriate category from a bank of icons: Auto, Jewelry, Art, Tools, Recordings, Electrical, Clothing, Furniture, or Miscellaneous. The program's 11 data entry fields allow detailed descriptions of each possession. Fields include Item, Make, Model, Serial Number, Quantity, Cost, Invoice, Date, and Comments. You can also specify the insurance carrier and the room the item is in. When you've finished entering the information, *Housekeeper* adds the item to the household inventory and lists it in a scrollable window (see "Add Infinite Items"). To edit or change an item, click on the item in the scroll window and it reappears in the data entry section. Once everything is listed, you may want to sort the list. You can sort alphabetically by clicking the Item entry field, arrange items in chronological order by clicking Date, or sort by cost or room by clicking the appropriate field. The program also lets you sort by multiple categories, one at a time. For example, you could list all the art objects in your living room, in order from most to least expensive.

Charts and Reports

If your house should ever be burglarized, *Housekeeper* will help prepare police and insurance reports. When you print a report, information about each item is listed in the order you've specified, and the total cost of all the items on a page is listed at the bottom. The program lets you enter information for up to three insurance companies and generate forms for each company.

In addition to providing printed reports for insurance companies, you may want to use *Housekeeper* to produce charts for your personal use. Charts are a piece of cake with *Housekeeper*—or in some cases, a piece of pie. Charts come in two types: 3-D or pie. Both display the ratio of the value of your possessions in each category, and the 3-D charts provide a breakdown by insurance carrier as well. A pie chart can be a real eye-opener; I had no idea that I'd spent as much on computers and electronic gadgets as I had on my car until I saw the slices.

(continues on page 160)



Add Infinite Items
Housekeeper *records information about your possessions, providing a database of household items that can prove useful in tracking expenses or creating insurance reports.*

MAC DRIVES DIRECT!

3 Reasons Why...

We are the Manufacturer.

By buying direct you avoid paying any retail dealer mark-ups. This is why our drives are so affordably priced. Warp Nine Engineering, a group of dedicated engineers & technicians, develops products strictly for the Macintosh. You can be assured of receiving a high quality, reliable drive.

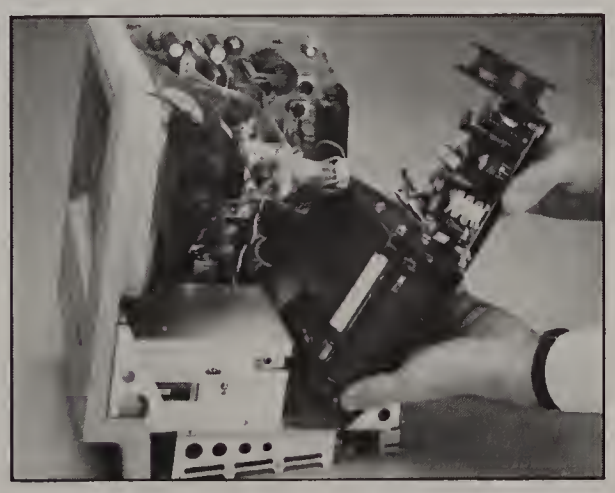
The Photon 20 External $795

In stock and ready to ship, the **PHOTON 20** Meg external hard drive plugs right into your MacPlus SCSI port. Priced hundreds less than the "other guys" yet tough, fast and quiet. Call us toll free (1-800-328-6795, ext. 433) to get your own **PHOTON 20**.

Convenient Customer Service.

Our support personnel are ready to answer your questions. Simply call us (again toll-free) any time during the day. We are here to help for as long as you own our drive. Most drives are sent out within 48 hours via UPS.

If you prefer we will ship overnight delivery. Either way, a factory fresh drive will be delivered direct to your door.



The WARP 20 Internal $895

Our **WARP 20** drive delivers portability and performance by mounting directly inside either a 512k or a MacPlus, no modifications are necessary. Hundreds of Mac owners—people just like you—have installed their own **WARP 20** hard drives. Our illustrated manual guides you through the installation. Tool kits are available on a loaner basis. Call us toll-free 1-800-328-6795, ext. 433 to order your **WARP 20**.

30 Days to Love It.

All Warp Nine drives come with a 30 day return privilege. Your satisfaction is the only judge. In addition, all our drives are covered by a 90 day warranty. If your drive fails return it. We will send you out a brand new drive right away. Full 1 year warranties are also available.

The Phaser 800 $239

Need more storage but 20 megabytes too much? Then we suggest our entry-level product—the **PHASER 800.** 800k of 3.5″ storage packed into a nice compact cabinet that works fast & quiet and fits easily into your Mac carrying case.

Now that you know why to get your drive from Warp Nine . . . why wait? Call us today 1-800-328-6795, ext. 433.

WARP NINE
ENGINEERING INC.
1751 W. COUNTY ROAD B
SUITE 107
ROSEVILLE, MN 55113

MasterCard VISA

Warp Nine is a trademark of Warp Nine Engineering Inc./Macintosh is a trademark of the Apple Computer Corp.

Circle 439 on reader service card

NORTHEASTERN Software

88 Ryders Lane, Stratford, Connecticut 06497

1. Tap our unmatched selection and inventory of software/hardware for the Mac and Apple (as well as the IBM PC and Commodore Amiga).
2. School and corporate purchase orders are welcomed. CALL 1-800-874-1108.
3. Special/rush orders. If something you need is not listed, hard to find, or needed in a hurry, CALL 1-800-874-1108.
4. Order Status. CALL (203) 375-3860.
5. FREQUENT PURCHASER PROGRAM. Effective 10/14/85, any repeat customer who has placed an order after 9/4/85 will automatically receive $1 off any order he or she places with us. Please mention to your operator that you are a repeat customer. We value your continuing business. Send in $1,000 worth of invoices (representing previous purchases) and you will receive a coupon worth 1% off any future purchase. With $5,000 worth of invoices, receive a coupon worth 5% off any future purchase.
6. SOFTWARE RENTAL LIBRARY. For 25% of our price, rent any program for two weeks. Apply your rental fee toward purchase if you choose.
7. No additional charges for credit card orders.
8. Technical experts on duty.
9. Convenient hours. 7 days/week: 9 AM-11 PM EST.
10. FREE AIR EXPRESS SHIPPING. Purchase $150 or more of software and for no additional charge we will ship your products by air courier. Mention this to your operator as you place your order.
11. FURTHER DISCOUNTS BY MAIL. Circle the items in our ad you want, send the ad in with the coupon below and receive $.50 off each item! Cut out a competitor's ad with a lower price and we will give you $1 off his price (subject to the conditions below).

ORDER EARLY FOR THE HOLIDAYS. IF ORDERING AT THE LAST MINUTE, OUR AIR EXPRESS SERVICE CAN RUSH YOUR SOFTWARE/HARDWARE TO YOU. HAVE A HAPPY AND SAFE HOLIDAYS!

MasterCard VISA

Send coupon and list of items desired to:
DISCOUNT BY MAIL DEPARTMENT
Northeastern Software, 88 Ryders Lane, Stratford, CT 06497

To be eligible for the $0.50 per item discount you must:
1. Fill out all items. 2. Send in our ad with the items you desire circled.

Name_____

Address_____
(Include Company Name)

City_____ State_____ Zip_____

Phone No. at above address_____

Check form of payment
☐ Visa ☐ MasterCard ☐ C.O.D. ☐ Personal Check
☐ Certified Check ☐ Money Order

Card No._____ Exp. Date_____

11 MACW

Personal and company checks allow 3 weeks to clear. For faster delivery, send cashier's check, certified check, or money order. Shipping—Software ($3.00 minimum). Shipping—Hardware (please call 203-375-3860). COD—Add an additional $2.00. Alaska, Hawaii, Canada, PO, APO, and FPO $5.00 minimum. Foreign orders—$15.00 minimum and 15% of all orders over $100. Mastercard and Visa (please include card no. and expiration date). Connecticut residents add 7.5% sales tax. Prices subject to change without notice. All returns must have a return authorization number. Call 203-375-3860 to obtain one before returning goods for replacement. Defective merchandise replaced with same item only. We do not guarantee compatibility. All sales are final.

"Comparable advertised price" does not include typographical errors on the part of other vendors or prices that do not reflect higher shipping costs, credit card charges, or membership fees. The $1 off offer only applies to items where Northeastern's price is not already the lowest. Final judgement remains with the manager on duty

WE WILL BEAT

(See Below)

SPECIALS

Apple Numeric Keyboard	139.00
Copy II Mac	18.75
Excel	221.00
Fontastic***	23.50
Fusillade	19.50
Gato	24.75
Haba BOOK Drive	255.00
Harrier Strike Mission	23.50
ImageWriter Ribbons	4.25
Mac 3D	112.50
Mac Be Cool	97.00
Mac Draft	137.50
Mac Golf	34.00
Mac Librarian	23.50
Mac Lightning	57.50
Microsoft Word	110.00
Microsoft Typeographer	110.00
Power Math	51.00
SideKick	42.50
ThinkTank 512K	95.00
Thunderscan (New Version)	166.00
Wizardy I	33.00

ACCESSORIES

AMERICAN TOURISTER	
Mac Carrying Case-Amer Tourist	59.00
APPLE COMPUTER	
Mac Security Kit	CALL
ASSIMILATION PROCESS	
Mac Numeric Turbo	CALL
Mac Port Adaptor	CALL
Mac Turbo Touch	CALL
Mac Daisy Wheel Connection	CALL
Mac Epson Connection	CALL
AST RESEARCH	
Ramstack 1.5 MB	1399.00
Ramstack 512K	599.00
Ramstack 2MB	1799.00
Ramstack 1MB	999.00
AUTOMATION FACILIIES	
Micro Clean	CALL
FloppyClean Refill	CALL
FloppyClean 3½	CALL
CRT Work Station Kit	CALL
Printer Keyboard Kit	CALL
CREIGHTON DEVELOPMENT	
ProPrint w/Cable	51.00
ProPrint	37.00
ProPrint w/A8 Switch & 2 Cable	134.00
CURTIS MANUFACTUKRING	
Ruby Surge Suppressor	48.00
Emerald Surge Suppressor	32.00
Sopphire Surge Suppressor	42.00
Diamonmd Surge Suppressor	27.00
DIVERSIONS INC.	
Underware Color Ribbon	CALL
Underware Jumbo Pens	CALL
Underware Color Pens	CALL
Underware Color Pack	CALL
Underware Carbon Paper/Pens	CALL
Underware Black Ribbons	CALL
ENVIRONMENTAL SOFTWARE	
Mac Cover Complete-Environment	14.00
Dust Cover Laserwriter-Mac ATT	16.50
Dust Cover Keypad-Mac Attire	5.00
Dust Cover Printer 15-Mac ATTI	12.50
Dust Cover Disk Drive-Environm	5.00
Dust Cover Printer 10-Mac ATTI	10.50
ERGOTRON	
Mac Tilt	69.00
GTCO CORPORATION	
MacIntizer	390.00
HABA SYSTEMS	
Haba Window Dialer	25.00
HANZON CORPORATION	
Hanzon Board & Cable	75.00
Innovation Concepts	
Flip N File II Micro	17.00
Flip N File I Micro	7.00
INNOVATION TECHNOLOGIES	
Easel The	11.50
Pocket	8.50
I/O DESIGN	
Mac Carrying Case-I/O	63.00
Imagewriter Carrying Case-I/O	36.50
KALMAR DESIGNS	
MicroCabinet-Double	20.00
MicroCabinet	12.00
KENSINGTON	
Swivel/Tilt-Kensington	21.00
Swivel-Kensington	20.00
Disk Case-Kensington	18.50
Dust Cover Printer 15-Kensington	8.00
Starter Pack-Kensington	51.00
Dust Cover Disk Drive-Kensington	6.95
Control Center-Kensington	59.00
Printer Stand	15.75
Polarizing Filter	30.50
A/B Box-Kensington	58.50
Surge Suppressor-Kensington	31.50
Disk Drive Cleaning Kit	18.75
Dust Cover-Kensington	8.00
Dust Cover Printer 10-Kensington	8.00
Mouse Cleaning Kit with Pocket	14.90
Mouse Pocket	6.00
KETTE GROUP	
MacNifty ABCD Port Switch	31.50
MacNifty Stereo Music System	54.00
MacNifty A/B Switch	21.50
Koala Technologies	
Mac Vision	167.00
KAT	131.00
KRAFT	
Quick Stick	44.00
MACADAM PUBLISHING	
Windoware Phone Book	29.95
Windoware Colendar	29.95
MAGNUM SOFTWARE	
Mouse Mover	13.75
MEGAHAUS	
Megadesk	58.75
MICRORAIN	
Mac Station	79.00
MICROSOFT	
Mac Enhancer	152.50
MJ ELECTRIC	
Mac Guard	59.00
MPH COMPUTERS	
Mac Be Cool	97.00
NEW IMAGE TECHNOLOGIES	
Magic Digitizer	240.00
OPTIMUM	
Mac Tote	59.50
PRACTICAL COMPUTER APPLICATIONS	
Mac BackUp	33.00
SOUTH BAY SYSTEMS	
Mouse Pad	12.00
SUMMAGRAPHICS	
Mac Tablet	399.00
SUPEREX	
Mac Speak	17.95
T MAKER	
Click on Worksheet	45.00
THUNDERWARE	
Thunderscan	166.00
VIDEO 7	
Mouse Stick	37.50

ACCOUNTING SOFTWARE

BizMac Inventory	279.00
BizMac Accounts Receivable	395.00
BizMac Payroll-Stand Alone	119.00
BizMac General Ledger	340.00
BizMac Accounts Payable	275.00
ARRAYS/CONTINENTAL	
Home Accountant	61.00
CHANGE LABS	
Rags to Riches GL	51.00
Rags to Riches AP	97.00
Rags to Riches AR	97.00
DIGITAL ETC.	
Mac Accountant	135.00
INTERMATRIX	
Chequebook	25.50
MONOGRAM	
Dollars & Sense	79.00
Forecast	39.00

***Top rated in a leading consumer magazine

Circle 215 on reader service card

CALL TOLL FREE 1-800-382-2242
Connecticut Orders Call (203) 375-3860
IN CANADA 1-800-843-0074

KASTEL TECHNOLOGY
Trivia Savant 22.00
MAGNUM SOFTWARE
Gypsy 22.75
MARK OF THE UNICORN
Mouse Stampede 22 00
MILES COMPUTING
Mac Wars CALL
Mac Attack 26.75
Fusillade 19.50
Overloads CALL
Harrier Strike Mission 26.75
MINDSCAPE
James Bond A View to a Kill CALL
Rambo 22.50
Balance of Power 29.50
Rastar CALL
Deja Vu-MindScape 32.50
Stephen Kings The Mist 22.50
MIRAGE CONCEPTS
Trivia 11.50
NEWSOFT
New Gammon 21.00
ORIGIN SYSTEMS
Ultima III 36.00
PBI SOFTWARE
Fokker Triplane 33.50
Strategic Conquest 28.50
Feathers & Space 20.75
PENGUIN
Pensate 21.50
Transylvania 21.50
Xyphus 21.50
Quest 21.50
PRACTICAL COMPUTER APPLICATIONS
Mac Golf 33.00
PROFESSIONAL SOFTWARE
Trivia Fever Volume II 13.95
Super Sports Trivia 18.00
Trivia Fever 20.50
PRYORITY SOFTWARE
Forbidden Quest 22.50
Gateway 24.00
SIERRA ON LINE
Ultima II 34.00
Frogger 21.50
Championship Boxing 21.50
SILICON BEACH SOFTWARE
Enchanted Scepters 20.50
Airborne 19.00
SIR TECH
Wizardry I 33.00
SOFT LIFE
Mac Slots 25.00
SPECTRUM HOLOBYTE
Gato 24.75
Orbiter 25.50
TELARIM
Dragon World 25.50
Amazon 25.50
Fahrenheit 451 25 50
Rendevous With Rama 25.50
UNICORN SOFTWARE
Futuria 23.75
Utopia 23.75
VIDEX
Mac Checkers & Reversi 27.50
Mac Vegas 33.00
FunPak 21.00
Mac Gammon & Cribbage 27.50

GRAPHICS SOFTWARE

ALTSYS
Fontographer CALL
Fontastic 23.50
ANN ARBOR SOFTWARE
Advanced Animation ToolKit I CALL
Animation ToolKit II CALL
Animation ToolKit I 30.00
In Motion CALL
APPLE COMPUTER
Mac Draw CALL
AXLON
Card Shoppe 31.00
Art Portfolio 33.00
Art Portfolio II CALL
CASSADY COMPANY
Fluent Fonts 28.00
CENTURY SOFTWARE
Laser Font Potomac CALL
Laser Font Willamette CALL
UltraFonts CALL
UltraFonts/Technical & Business CALL
Technical & Business Fonts CALL
Diablo Valley Design CALL
Mac Grid 26.00
DIVERSION INC.
Jumbo Color Pens 12.75
Underware Pens 9.95
Underware Ribbon 8.75
DRUID
Classic Fonts CALL
Graphic Letters CALL
ENTERSET
Quick Paint 28.75
HAYDEN SOFTWARE
DaVinci Commercial Interiors 113.00
DaVinci Interiors 26.50
DaVinci Houses 26.50
Video Works 54.00
DaVinci Building Blocks 44.50
DaVinci Landscapes 26.50
Home Design 45.50
Art Grabber w/Body Shop 28.50
INNOVATIVE DATA DESIGN
Mac Draft 135.00
Paste Ease 34.75
KENSINGTON
Professional Type Fonts-Headline 39.00
Graphic Accents 28.00
Professional Type Fonts-Text 28.00
MAGNUM SOFTWARE
Slide Show Magician 31.00
Mc Pic Volume 1 26.00
Mc Pic Volume 2 26.00
MANHATTAN GRAPHICS
Ready Set Go 58.00
MESA GRAPHICS
Plot It 66.00
MICRO MAPS
Mac Atlas World 57.00
Mac Atlas USA 57.00
MICROSPOT
Mac Plot CALL
MILES COMPUTING
Mac The Knife Volume I 20.00
Mac The Knife Volume II 24.00
Mac The Knife Volume III 26.75
T MAKER
Click Art Publications 27.00
Click Art Effects 27.00
Click Art Letters 27.00
Click Art Personal Graphics 27.00

LANGUAGES

APPLE COMPUTER
Mac Pascal CALL
MacIntosh 68000 Development CALL
CONSULAIR
Mac C W/Tool Kit CALL
CREATIVE SOLUTIONS
Mac Forth Level I 76.00
EXPERTELLIGENCE
Expert Lisp 235.00
Expert OPS 5 163.00
Expert Logo 70.00
HIPPOPOTAMUS
Hippo-C Upgrade Kit
Hippo C Level I 74.50
Hippo C Level II 214.00
KRIYA SYSTEMS INC.
Neon 125.00
MAINSTAY
MacAsm 74.50
MANX
Aztec C68K-P 160.00
Aztec C68K-C 403.00
Aztec C68K-D 241.00
Aztec C64K-C 403.00
MICROMOTION
MasterForth 88.00
MICROSOFT
Basic-MicroSoft 84.00
Fortran Compiler-MicroSoft 168.00
Logo-MicroSoft 73.00
SOFTWORKS LIMITED
SoftWorks C Compiler 234.00

MODEMS

APPLE COMPUTER
Apple Personal Modem. 300/1200 CALL
COMPUCABLE
Cable Mac To Hayes 15.50
HAYES MICROCOMPUTING
SmartModem 1200 363.00
SmartModem 2400 575.00
SmartModem 300 128.00
Transet 268 00
KENSINGTON
Portable Modem 300 Baud 85.00
MICROCOM
Mac Modem 2400 w/Software 553.00
Mac Modem 1200 w/Software 385.00
NOVATION
Cat Comm Communication System 274.00
Novation 2400 Baud CALL
PRENTICE
PopCom X 100 253.00
PROMETHEUS
ProModem 1200 w/Mac Software 318.00
US ROBOTICS
Courier 2400 380.00
Password 1200 195.00

PRINTERS

APPLE COMPUTER
LaserWriter CALL
ImageWriter II CALL
ImageWriter 15 CALL
ImageWriter II 32K Buffer 77.00
ImageWriter II Cut Sheet Feed 160.00
BROTHER
HR 35 665.00
HR 25 450.00
HR 15 XL 335.00
EPSOM
AP 80 CALL
DX 10 CALL
LX 80 205.00
LX 90 CALL
DX 20 CALL
LQ 800 CALL
LQ 1000 CALL
LQ 1500 CALL
SQ 2000 CALL
JUKI
6100S 375.00
5510S 449.00
6300S 639.00
NEC
NEC 3510 990.00
NEC 8810 1270.00
ELF 360 380.00
OKIDATA
1935 Mac/Lisa 540.00
192S MaC/Lisa 360.00
TOSHIBA
351 1020.00
1340 390.00
351 Tractor 150.00

THE MOST EXTENS
SELECTION AT TH

ANY COMPARABLE ADVERTISED P

PALANTIR
Accounts Receivable-Palantir 68.50
Accounts Payable-Palantir 68.50
Inventory Control-Palantir 68.50
General Ledger-Palantir 68.50
PEACHTREE
Accounts Payable-Peachtree 83.00
General Ledger-Peachtree 83.00
Accounts Receivable-Peachtree 83.00
SIERRA ON LINE
Accountants Choice Each ..... CALL
Mac One Write 133.00
Mac One Write Payroll 133.00
SOFTSYNC
Personal Accountant 49.00
STATE OF THE ART
Electric Checkbook 43.00
TIMEWORKS
J.K. Lassers Money Manager ..... CALL
UNITED SOFTWARE
In House Accountant 109.00

BOOKS

MICROSOFT PRESS
Mac Work Mac Play 13.00
Mac Inations-Microsoft 13.00
Apple MacIntosh Book 13.00
Inside Mac Paint 13.00
Presentation Graphics 13.00
Lotus Guide to Jazz 15.00
Printed Word The 13.00
MacIntosh Software Book of 17.00
Multiplan Book-Microsoft 12.00
Inside Mac Project 13.00
Mac Work Multiplan 13.00

BUSINESS SOFTWARE

ADVANCED LOGIC SYSTEMS
Mighty Mac 35.00
AEGIS
Zap! Invoice 53.00
Housekeeper The 31.50
ALDUS
Page Maker ..... CALL
ALLEGRO SOFTWARE
Multiplan Templates-Busns Anal 28.50
Multiplan Templates-Pers Finan 28.50
Softstart 28.50
APPLE COMPUTER
Mac Project ..... CALL
APPLIED LOGIC SYSTEMS
Mac Math Pac 165.00

APROPOS
Financial Planning 44.50
Investment Planning 44.50
Tax Planner 33.00
ARTSCI
SoftFarms 24.00
Magic File 57.00
ASSIMILATION PROCESS
Business Essentials ..... CALL
Mac Spell Right ..... CALL
Right Word The ..... CALL
BLYTH SOFTWARE
OMNIS III 243.00
BOSTON SOFTWARE
Mac Publisher 69.00
BRAINPOWER
Stat View 97.00
CHANG LABS
Three Pack 245.00
COMPUTER: APPLICATION INC.
II In A Mac 51.50
CREIGHTON SOFTWARE
Mac Office 23.00
Mac Spell Plus 51.00
Mac Home 23.00
CRICKET SOFTWARE
Cricket Graph 133.00
CRYSTAL CANYON
Mac Librarian 24.00
DATA FOOD
OrawFarms 29.50
Mac Forms 41.50
DATALOGICA
dMAC III ..... CALL
DATA PACK SOFTWARE
Executive Office ..... CALL
My Office 94.50
DOW JONES SOFTWARE
Spreadsheet Link 55.00
Straight Talk 44.50
Dow Jones Membership Kit 17.00
Market Manager Plus 108.50
DREAMS OF THE PHEONIX
Day Keeper Calendar 26.50
ELECTRONIC ARTS
Financial Cookbook 31.75
EMERGING TECHNOLOGIES
Macoffix 78.00
ENTERSET
Quick Word 31.00
FORETHOUGHT
FactFinder 83.50
FileMaker 104.50
FORTNUM SOFTWARE
Mac Nest 30.50
HABASYSTEMS
Quartet 110.00
Habo Wills 31.50
Habo Business Forms 31.50
Habo Business Letters 31.50

HARRIS TECHNICAL SYSTEMS
Profit Projection/Breakeven An 46.00
HAYDEN SOFTWARE
I Know It's Here Somewhere 34.00
Ensemble 139.00
Hayden Speller 44.00
Hayden Chart 58.50
HAYES MICROCOMPUTING
Please 122.00
HEYDEN & SON
Stat Works 86.00
HOWARD SOFT
Howard Tax Preparer ..... CALL
HUMAN EDGE SOFTWARE
Mind Prober 25.00
LAZER SOFTWARE
Lazerbase 58.50
LAYERED
Front Desk 75.00
LIGHTYEAR INC
Lightyear ..... CALL
LIVING VIDEOTEXT
Think Tank 128K 73.00
Think Tank 512K 95.00
LOTUS DEVELOPMENT
Jazz 338.00
MAINSTAY
Turbo Download 24.75
MAIN STREET SOFTWARE
Main Street Writer 51.00
Main Street Filer 51.00
MEACOM
Mac plus II 68.50
MEGAHAUS
Megafiler 90.00
Megamerge 60.00
Megaform 145.00
MEGAMAX, INC.
Megamax C Compiler 173.50
MESA GRAPHICS
Tekalike 177.00
MICRO PLANNING SOFTWARE
Micro Planner 235.00
MICROSOFT
Excel 223.00
Chart 71.00
Multiplan 105.00
File 110.00
Typographer 110.00
Word 110.00
NOLO LEGAL SOFTWARE
Will Writer 24.75
ODESTA
Helix 215.00
ODS INC.
Consultant 108.50
PALADIN
Crunch 164.00
PALANTIR
In Touch 77.75

PROVUE DEVELOPMENT
Overvue 146.00
REAL DATA
Residential Real Estate 59.00
Financial Analysts 59.00
Tax Shelter Syndication Analyst 167.00
Real Estate Investment Analyst 87.00
Mortgage Qualifier 117.00
Property Management I 173.00
On Schedule 117.00
Commercial Industrial App. 60.00
SATORI SOFTWARE
Bulk Mailer 78.00
SIMON & SCHUSTER
Construction Estimator 41.00
SMITH MICRO
Market Link 41.50
Stock Portfolio System 105.00
SOFT DESIGN
Time Base 86.00
SOFTSTYLE
Decision Map 73.00
SOFTECH MICROSYSTEMS
Mail Manager 68.50
SOFTVIEW
MacInTax 85 ..... 51.50
SOFTWARE PUBLISHING
PFS File/Report Combo 99.00
PFS Report 69.00
PFS File 69.00
SOUTHEASTERN SOFTWARE
Mac Transfer 30.75
STATSOFT
Data Fast 38.50
STONEWARE
DB Master Mac 102.00
SUPEREX
Mac Notes 53.00
TELOS
FileVision 94.00
WARNER
Desk Organizer 54.00

COMMUNICATION SOFTWARE

APPLE COMPUTER
Mac Terminal ..... CALL
COMPUSERVE
Compuserve Starter Kit 18.00
DATAVIZ
Mac Link ..... CALL
Mac Link w/Cable 86.75
DILITHIUM PRESS
PC to Mac & Back 75.75
DOW JONES SOFTWARE
Straight Talk 43.00

SIVE MACINTOSH
IE BEST PRICES!!!

RICE BY $1

DREAMS OF THE PHEONIX
Mouse Exchange BBS 26.75
Mouse Exchange Terminal 26.75
HAYES MICROCOMPUTING
SmartCom II 85.00
MAINSTAY
Telescape 77.50
SOFTWARE MASTERS
In Touch 96.00
SOURCE OF LINE
Source On-Line Info Network 25.00
VIDEX
Mail Center for Six 268.00
Mail Center for Two 168.00
AEGIS
Mac Mail Apple Tak ..... CALL
Mac Mail Telecom ..... CALL
HABA SYSTEMS
Haba Dialer ..... CALL
Haba Dialer/Window Dialer ..... CALL
Habo Com ..... CALL
INTERMATRIX
Phone Link ..... CALL
SOUTHEASTERN SOFTWARE
Mac Transfer ..... CALL

DISK DRIVES

APPLE COMPUTER
MacIntosh Hard Disk 20MB CALL
Mac 512K CALL
Mac +/1 Meg CALL
Mac External 800K Drive-Apple CALL
CORVUS
5.5 M8 Mac OmniDrive 979.00
Omni Talk 175.00
45.1M8 Mac OmniDrive 3399.00
11.1M8 Mac OmniDrive 1379.00
21.6M8 Mac OmniDrive 1959.00
HABA SYSTEMS
Haba Disk 800K8 255.00
IOMEGA
Iomega Drives for Mac .. CALL
5MB Cartridge-Iomega 38.00
Head Cleaning Kit-Bernoulli 56.75

DESK ACCESSORY PROGRAMS

BATTERIES INCLUDED
Battery Pack 26.50
DUBL-CLICK SOFTWARE
Calculator Const. Set 58.50
DREAMS OF THE PHOENIX
Twelve C 26.75
ELECTRONIC ARTS
Custom Calc Set 33.50

ENTERSET
Quick Set 26.75
Quick Paint 26.75
MAINSTAY
Type Now 25.75
HARVARD ASSOCIATES
Desk Tappers 28.50
SILICON BEACH SOFTWARE
Accessory Pack 1 ..... 20.75
VIDEX
Mac Calendar 48.50

BLANK DISKS

BASF 3½ SS/00 ..... 11.00
BASF 3½ DS/00 ..... 16.00
Verbatim 3½ SS/00 ..... 22.50
Elephant 3½ SS/00 ..... 22.00
Fuji 3½ SS/00 ..... 20.00
Maxell 3½ SS/00 ..... 21.50
Memorex 3½ SS/DD 22.50
Sony 3½ SS/00 ..... 19.00
Sony 3½ DS/DS 32.00

EDUCATIONAL SOFTWARE

ATI
How to Use MultiPlan 28.00
Teach Yourself Multiplan 28.50
Mac Coach 38.50
Teach Yourself Excel 44.50
Teach Yourself Jazz 38.50
BRAINPOWER
PowerMath 51.00
Chipwits 25.75
ThinkFast 21.75
CAMDE
Nutricalc 48.75
DAVIDSON AND ASSOCIATES
Spell It 26.75
Word Attack 26.75
Math Blaster 26.75
Speed Reader II 36.75
ELECTRONIC ARTS
One On One 26.75
FIRSTY BYTE
Smooth Talker 48.00
KidTalk 39.00
Speller Bee 41.50
FORETHOUGHT
Typing Intrigue 28.00
FORTNUM SOFTWARE
Mac Chemistry 97.50
GREATWAVE SOFTWARE
Concertware Plus 38.00

HARVARD ASSOCIATES
Mac Manager 28.00
HAYDEN SOFTWARE
Music Works 44.00
Turbo Turtle 34.00
HIPPOPOTAMUS SOFTWARE
Hippo Computer Almanac 19.75
MARK OF THE UNICORN
Professional Composer 244.00
MICROSOFT
Entrepreneur 28.50
Learning Multiplan & Chart 36.00
PALANTIR
Mac Type 24.00
Word Play 25.75
Math Flash 25.75
QUEUE INTELLECTUAL SOFTWARE
Starting a New Business 43.00
RUBICON PUBLISHING
Song Painter 31.50
Deja Vu-Rubicon 21.75
SCARBOROUGH
MasterType 24.75
Run for the Money 28.50
Make Millions 28.50
SIMON & SCHUSTER
Mac Art Department 23.00
Typing Tutor III 30.50
Paper Airplane Construction Set 23.00
SPECTRUM HOLOBYTE
TellStar Astronomy Program 39.00
Terrapin
Mac Logo 64.50
THINK EDUCATIONAL
Mac Edge II 27.75
Mind Over Mac 27.75
Mac Edge Plus 27.75
TIMEWORKS
Evelyn Wood Dynamic Reader 40.00

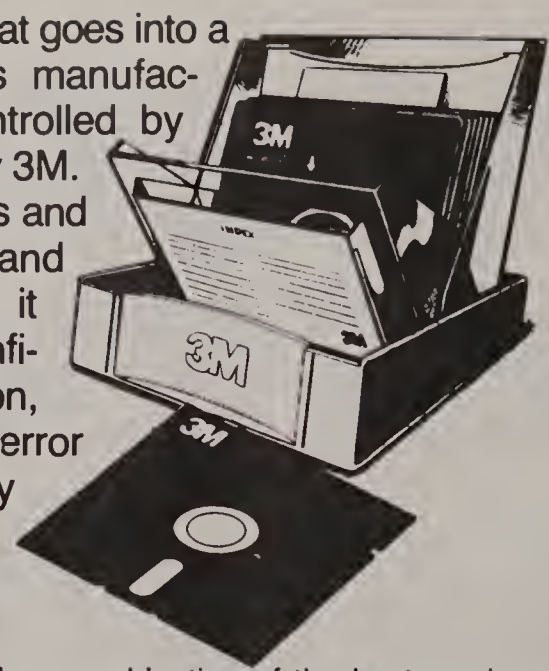
ENTERTAINMENT

ACTIVISION
Mindshadow 25.00
Borrowed Time 25.00
Championship Stor Baseball 20.75
AEGIS
Pyramid of Peril 21.00
Mac Challenger 21.00
Red Flag 21.00
ANN ARBOR SOFTWARE
Grid Wars 27.00
Lunar Explorer 35.00
ARTSCI
Hearts 17.50
AXLON
Mac Match 29.00

BLUE CHIP SOFTWARE
Squire 28.00
Baron 28.00
Tycoon 28.00
Millionaire 28.00
BRAINPOWER
Torpedo Run 27.00
BRODERBUND
Cyborg 23.00
Ancient Art of War 26.00
Lode Runner 23.00
CBS SOFTWARE
Murder by the Dozen 24.00
CHALLENGER SOFTWARE
Legacy ..... CALL
CREIGHTON DEVELOPMENT
Mac Commond 17.75
ELECTRONIC ARTS
PinBall Construction Set 26.75
Deluxe Music Construction Set 31.75
Skyfox CALL
EPYX
Rogue 17.50
Temple of Apshai Trilogy 22.50
Winter Games 22.50
EXPERT SYSTEMS
Mac Gamman ..... CALL
GENERAL COMPUTER COMPANY
Ground Zero 23.50
HAYDEN SOFTWARE
Word Challenge II 23.00
Sargon III 28.00
Perplex 23.00
Masterpieces 23.00
Holy Grail 28.00
Computer Novel Construction Set 28.00
HENDERSON ASSOCIATES
Real Poker 20.00
HIPPOPOTAMUS SOFTWARE
Hippo Jokes & Quotes 19.75
INFOCOM
A Mind Forever Voyaging 25.75
Cutthroats 22.75
Deadline 28.00
Enchanter 22.75
Hitchikers Guide to The Galaxy 22.75
Infidel 25.75
PlanetFall 22.75
SeaStalker 22.75
Sorcerer 25.75
Spellbreaker 28.75
StarCross 28.00
Suspect 25.75
Suspended 25.75
Wishbringer 22.75
Witness 22.75
Zork I 22.75
Zork II 25.75
Zork III 25.75

3M diskettes

Everything that goes into a 3M diskette is manufactured and/or controlled by specifications set by 3M. From unique substrates and oxides, to hole punching and jacket fabrication, 3M does it all and does it well. With confidence in your complete satisfaction, 3M diskettes are certified to be error free and have an unlimited warranty against defects in workmanship or materials. Day in and day out 3M gives you one less thing to worry about.



What separates us from our competition? Simply a combination of the best service in the industry, highly competitive pricing, and an ever widening range of products. Above all we care about our reputation and we are willing to work on a lower margin while delivering what others only claim—and we do it all on a day-in day-out basis.

Early in 1986 every subscriber to **Mac World** will receive our New 1986 First Edition Catalog with 16 additional pages and dramatically lower pricing. We want to be your source for computer supplies & accessories.

Lyben Computer Systems

WATCH FOR OUR NEW 1986 CATALOG

1050 E. MAPLE RD. • TROY, MI 48083
(313) 589-3440
Circle 455 on reader service card

RUN THOUSANDS OF APPLE II PROGRAMS ON YOUR MAC WITH

II in a MAC™

FEATURES

a) Supports Hi-Res, Lo-Res Graphics & all text modes.
b) Supports 80 Column & uses full MAC screen.
c) Supports joystick with modifyable axis.
d) Emulates full 4 drive Apple system.
e) Complete Apple RAM disk emulation.
f) Communications disk to transfer software from Apple or download from BBS

Run ProDOS or DOS3.3 software on your 512K MAC without modification.

Micro-W. DISTRIBUTING, INC
1342B Route 23
Butler, New Jersey 07405

FEATURES

g) Program the MAC in Applesoft, Integer, & standard Apple machine language.
h) Access printer & modem with standard Apple software.
i) Supports Lang. card, Clock, Keyboard buffer & std 68000 system calls.
j) Comes with complete emulation and system master software.
k) Help screens available.

Dealer and Distributor Inquiries Invited

Call 201-838-9027 to Order

Circle 472 on reader service card

(continued from page 154)

Does It Make the Grade?

Overall, *Housekeeper* earns a grade of B+. The program does what it sets out to do, and it does it efficiently. Because the program is a simple, single-purpose database, it is easy to use. For the same reason, it lacks flexibility. For example, you can't add to or change the data entry fields. But there are enough fields so that, with a little ingenuity, you can describe just about anything you own. A few idiosyncracies in the user interface can prove annoying. For example, to save a newly created file you must choose Save As, rather than Save, from the File menu; choosing Save wipes out your data. I also noticed some sorting problems. A list of 30 or so items sorts just fine, but when I alphabetized the 152-item sample database, three items were inexplicably out of order. This is a minor bug, however, in an otherwise competent program.—*Carol Johnson*

The Housekeeper, version 1.4
Aegis Development, Inc.
2210 Wilshire Blvd. #277
Santa Monica, CA 90403
213/306-0735
List price: $59.95

Word of Mouse

If you're like many Macintosh owners, you occasionally attend user group meetings. There you can see programs demonstrated, ask fellow users questions, and hear the latest industry rumors. But if you have a pressing programming question or want to get hold of a public-domain desk accessory you saw at the last meeting, you may find yourself wishing that you could talk to members of the group at any time.

With some user groups, you can do just that. Many groups run a bulletin board system (BBS) that puts club news only a phone call away for any member who has a computer, a modem, and a communications program. You can leave private or public messages for other BBS users, read their messages, and trade public-domain programs by uploading and downloading them across the phone line. Best of all, these boards are usually operated by volunteers and cost only the price of a phone call for group members. Some bulletin boards are also operated by individual

(continues on page 162)

Charter Subscriber Savings

Publish!

The Magazine of Personal Computer Publishing.

New! From the publishers of Macworld and PC World.

Save 33%!

NO POSTAGE NECESSARY IF MAILED IN UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Publish!
Subscription Department
P.O. Box 51966
Boulder, Colorado 80321-1966

Publish! Now and Save 33%!

YES! *Enter my Charter Subscription, which entitles me to 33% savings off the basic subscription price–only $19.95 for a full year (6 bimonthly issues).* ☐ *Payment enclosed* ☐ *Bill me later*

Name

Company (if applicable)

Street

City *State* *Zip*

Offer valid in the U.S. only. Premier issue will be mailed in August 1986.

4CYJ0

Be a Charter Subscriber and SAVE!

Use the postpaid card or call TOLL-FREE 800/222-2990

The Authoritative New Magazine from the Publishers of PC World and Macworld

Publish!

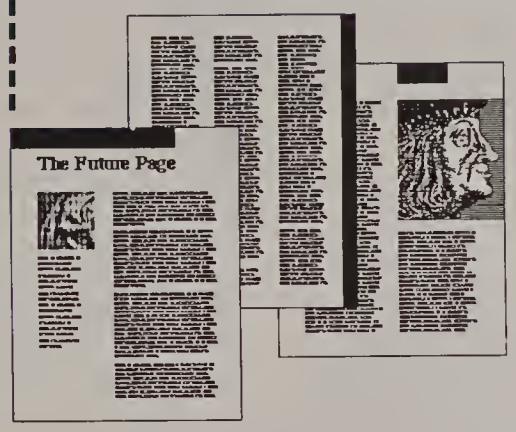
The Magazine of Personal Computer Publishing

If you use a Macintosh or PC system to publish documents, reports, newsletters, books, brochures, ads, presentation graphics, or any other printed material, then you need ***Publish!***, The Magazine of Personal Computer Publishing.

Act Now for Charter Subscriber Savings—33% Off!

Personal computer publishing is the most significant development in producing printed material since Gutenberg invented movable type. Laser printers and other advanced peripherals and software have made it possible to create high-quality printed documents without the time-consuming expense of typesetting and pasteup.

Publish! is the first sophisticated magazine to be entirely written, edited, and produced on personal computer-based systems. By being on the cutting edge of this exciting new technology, ***Publish!*** is the one truly expert guide that you can depend on for all the information you need to set up and manage your own operation.



Each colorful, feature-filled issue is extraordinarily easy to read and understand. ***Publish!*** answers all your questions about using personal computers with laser printers, plotters, digitizers, word processors, page-makeup software, and even the latest personal computer-interface commercial typesetting systems. We cover stand-alone systems as well as completely networked editorial systems.

Publish! saves you money and time while giving you total control over your published material. In addition to showing you the shortcuts and tricks of the technology, ***Publish!*** teaches you about design and graphics as well as other publishing fundamentals.

In ***Publish!*** you get the benefit of unbiased, professional reviews, practical how-to articles, and the latest news of what's happening in this fast-moving area of computer publishing.

Best of all, ***Publish!*** can be yours at a surprisingly low price—if you act now and become a Charter Subscriber! For a limited time, Charter Subscriptions are available for just $19.95 for a full year (6 bimonthly issues). You save 33% off the basic subscription price others will pay when the Charter offer closes.

Take advantage of this limited-time Charter Subscriber offer now and get the full benefit of ***Publish!***'s expertise as soon as possible. Mail the attached postpaid card or the coupon below. Or for faster service, call TOLL-FREE 800/222-2990.

Charter Subscription Savings

YES, *I want to be among the first to take advantage of* ***Publish!****. Enter my Charter Subscription for 1 year—6 bimonthly issues—at only $19.95. I save 33% off the basic subscription price.*

☐ *Payment enclosed* ☐ *Bill me later*
Charge my ☐ *Visa* ☐ *MasterCard*

Card no. (please print)

Expiration date

Name

Company (if applicable)

Street

City

State *Zip*

Mail to: ***Publish!****, Subscription Department, P.O. Box 51966, Boulder, Colorado 80321-1966*

Guarantee: If you're ever dissatisfied with ***Publish!****, let us know, and we'll promptly refund you for every issue remaining on your subscription. No questions, no problems. We guarantee it.*

Offer valid in the U.S. only. Premier issue will be mailed in August 1986. 4CYL6

(continued from page 160)

users who are happy to have others converse with their computer and trade information.

Dreams of the Phoenix offers a program, ***Mouse Exchange BBS,*** that allows you to set up an on-line bulletin board. *Mouse Exchange* is generally easy to use, both for the people managing the BBS and for callers. Although the program will work on a single-drive, 128K Mac for those who want to operate a BBS just as a message center, user groups operating a BBS need a hard disk to hold a substantial selection of software. For more limited applications, such as a BBS operated by a software developer to distribute the newest version of a program and to receive comments from testers, a two-drive, 512K Mac would probably be adequate.

Setting Up a BBS

Mouse Exchange comes with a 30-page manual that explains the bookkeeping files you must create to run the program. You use a text editor such as *MacWrite* to type in the information that people see when they log on. You also set up text files for keeping track of people's passwords and for listing the locations of various files. *Mouse Exchange* also allows you to specify an access level for each user; depending on the access number you assign, the caller will be granted or denied access to various parts of the board.

Mouse Exchange handles private mail messages from one BBS user to another, as well as messages posted to a public news section. The public section can be divided into as many as ten categories, so people with a specific interest won't have to read every message posted. You can make certain categories available only to people with a high enough access level, allowing, for example, communication among BBS operators about system-related topics that aren't of interest to most users.

Mouse Exchange also lets you upload and download files. The files section of the board, like news, can be categorized. As people upload files, the title of the file, the date and time uploaded, the file size, and a short description of the file are added to a file directory.

The BBS also includes a command for paging the system operator. When this command is selected, the Macintosh running the BBS beeps several times. The system operator, if present, can then select the Chat On menu option and type a message directly to the user. The system operator can select Chat On at almost any time, even if a user has not paged the operator.

Another helpful command prints a complete list of BBS users. Because *Mouse Exchange* keeps track of people by first and last names, no mail can be sent to someone whose name is misspelled. The command can be used to find the correct spelling of a name.

A Good Workhorse, but Give Us Graphics

Mouse Exchange is quite adequate for handling file transfers, mail, and information such as user group minutes and news, although the current version does not support a quick, easy type of file transfer

(continues on page 164)

WHY PAY HUNDREDS OF DOLLARS FOR A FILING SYSTEM ...AND SETTLE FOR SECOND BEST?

Introducing **Record Holder**™, the *best* Data Manager for the Mac, at a ridiculously low introductory price of **$49.95**

Record Holder is a full function data manager that allows you to store up to 32K of text and is so easy to use that you can get a report out in less than 5 minutes.

Easy To Learn
- Comprehensive manual includes a tutorial section.
- You never feel lost with over 100 HELP screens.

Easy To Use
- Need not define the length of your fields. All fields are variable in length.
- What you see is what you get. Designing both Screen and Report is as easy as clicking and dragging with the mouse.
- Make mailing labels in seconds.

Flexible
- Allows text fields of up to 32,000 characters.
- Allows Calculated or Computed fields.
- Allows Date, Numeric and Money formats.

Loaded With Features
- Unique Table of Contents Window allows global view of your database and instant access to any record.
- Powerful and flexible searching capabilities.
- Allows Totals, Averages and Count as well as Running Totals and Running Counts for Report generation.
- Up to 124 sort levels for Report generation.
- Allows unlimited number of Report Formats per file.
- Automatic SAVE feature to ensure data integrity.
- Compatible with the Macintosh 128K, 512K and the XL.

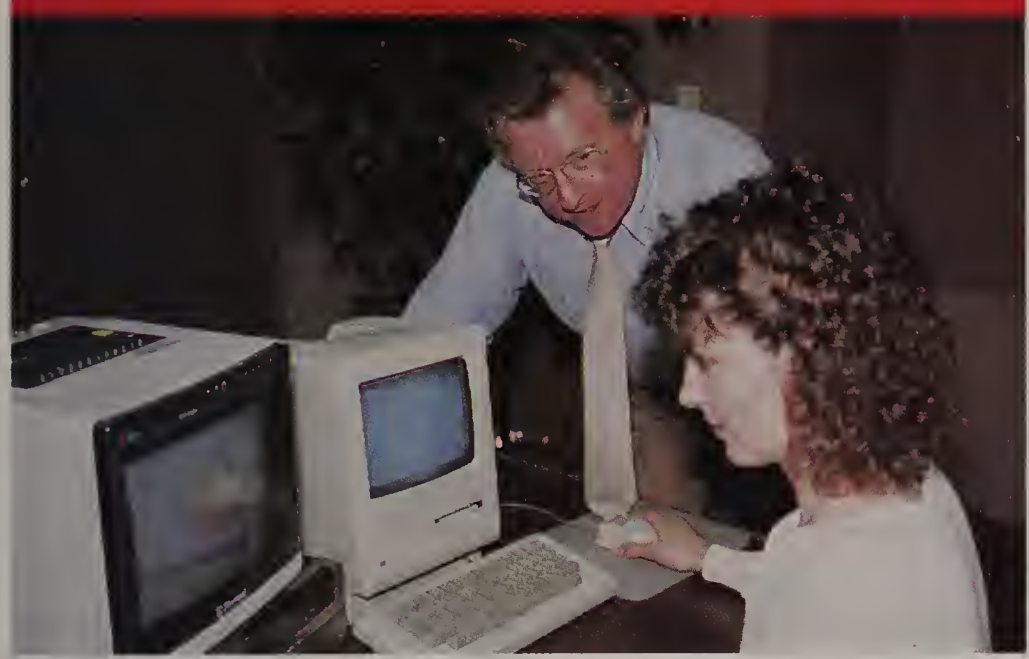
For more info, call: **(203) 872-1024**
To order by credit card, call toll free (7 days a week, 24 hrs. a day):
1-800-437-5200, op. 229
In Maryland, Call: **1-800-638-8890, op. 229**
Or send check or money order to:
Software Discoveries, Inc.
99 Crestwood Road, Tolland, CT 06084

Master Card/Visa Accepted.
Add $5 for shipping and handling.
CT residents please add 7.5% sales tax.

Record Holder is a trademark of Software Discoveries, Inc. Macintosh is a licensed trademark of Apple Computer, Inc © Software Discoveries, Inc. 1985

Circle 435 on reader service card

New MacVideo™



Learn by looking. MacVideo™ now makes it simple and exciting to get the most out of your Mac.

Desktop Publishing *with Ray Peddersen.* Put your design, layout, typesetting and pasteup on line with your Mac. Then simply print out camera-ready proofs. This video shows how easily (and cost-effective) your Mac can be in preparing a variety of materials from newsletters to ads and annual reports. A must for new people learning the program. $29.95

Desktop Publishing & MacPlus by video cassette.

The MacPlus *with Ray Peddersen.* This video makes learning even easier. And since the Mac's orientation is graphic, its functions on video can help you become productive more quickly. Think of it as a video tutor. $29.95

MacColor. MacIntosh compatible color video graphics system. New on MacVideo.

Dealer Inquiries Welcome.

A Technology Transfer, Inc. Production

Coming in June . . . subscribe *Now* and *Save!*

MacVideo GRAPHIC SOFTWARE REVIEW Videomagazine
MacVideo BUSINESS SOFTWARE REVIEW Videomagazine
6 issues a year. Approximately 60 minutes each.

Keep up with the exciting new programs being developed for graphics and business while you relax in your easy chair by the VCR. What better way to *see* how software actually functions on your Mac. The very best way to make choices for business and graphics. Each videomagazine provides you with an update and an extensive cross section of new programs becoming available for your Mac. Edited by professionals with an eye to practical applications.

SUBSCRIBE NOW AND GET A CHARTER SUBSCRIBER DISCOUNT OF $100.00. Our guarantee: If at any time you are not satisfied with one of our videomagazines, return it for a refund off its price, or at your option, a full credit towards your next subscription.

Technology Transfer, Inc./Pace Media
419 Wakara Way, Dept. MW
University of Utah Research Park
Salt Lake City, Utah 84108
A Division of Technology Transfer, Inc.

Send me MacVideo!
Specify: ☐VHS or ☐Beta
☐ **"The Mac PLUS"**
26 mins., @ $29.95
☐ **"The Desk Top Publisher"**
26 mins., @ $29.95
(Include $2 for each tape for mail and handling)

SIGN ME UP AS A CHARTER SUBSCRIBER TO:
☐ **"MacVideo Graphic Software Review"**
6 issues per year, $199 subscription (reg $300).
☐ **"MacVideo Business Software Review"**
6 issues per year, $299 subscription (reg $400).

Make all checks payable to Technology Transfer, Inc.

VISA ☐ **MASTERCARD** ☐ **AMER. EXPRESS** ☐

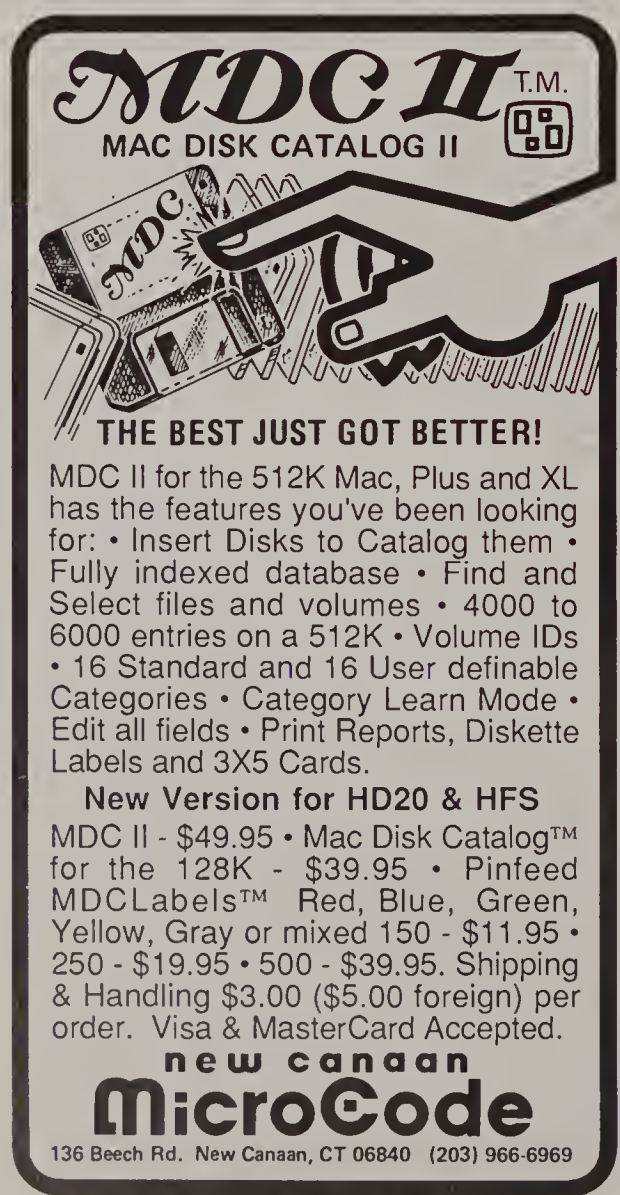
Number:_____ Expires:_____

Name | Address | City | State, Zip | Amount enclosed

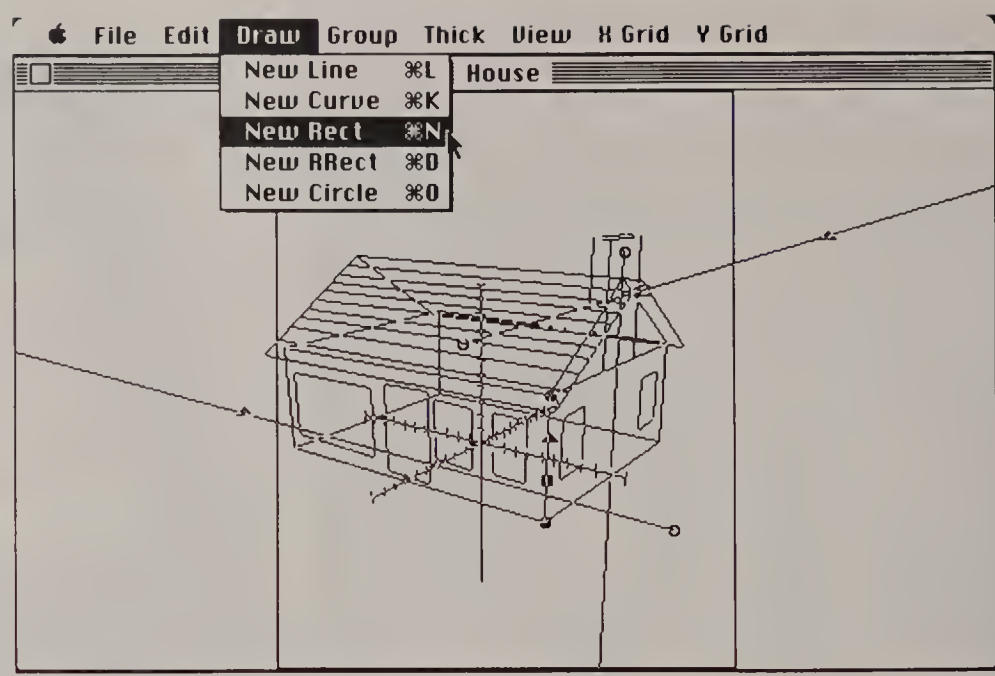
MacVideo™ is an independent product of Pace Media/TTI. Apple Computer, Inc. is a registered trademark of Apple Computer, Inc. MacIntosh is a trademark licensed to Apple Computer, Inc.

Circle 503 on reader service card

512K
UPGRADES
$159.00
• Visa and Master Card Accepted •
• No Down Time •
• Free Software •
• Free Shipping •
TO ORDER DIAL
800 8MAC MEM
Inside California
408-773-9922
MACMEMORY INC.
473 Macara Ave., Suite 701
Sunnyvale, CA 94086
Circle 337 on reader service card



Circle 284 on reader service card



Full-Page Outline 4paint *lets you draw on an entire 8½- by 11-inch page. A sketch can be saved as a* MacPaint *document and touched up in* MacPaint.

(continued from page 162)

called MacBinary. Instead, files must be stored as converted text files, to be decoded after downloading.

Novices will have little trouble understanding how to navigate around the system, since menu prompts are clear and a help screen is available. For the expert user, though, *Mouse Exchange* lacks a good full-screen editor. The editor supplied is a line editor, so it is best to prepare text using a program like *MacWrite* and then transfer the text to *Mouse Exchange* once it is completed. The program also lacks quick commands to get you from one function to another in a hurry. You have to return step by step to the main menu before changing sections.

The current version of *Mouse Exchange* does not make use of the Macintosh interface. It supports only a text display, much like bulletin boards for other computers. Apple II and IBM PC users can call a Macintosh that runs *Mouse Exchange* and feel right at home. *Mouse Exchange* doesn't allow you to use the mouse to issue commands to the bulletin board, nor can you send or receive graphics except as stored files to be opened off line.

Despite these minor drawbacks, *Mouse Exchange BBS* is well worth its price. If your user group is shopping for a bulletin board program, *Mouse Exchange* will provide an effective, inexpensive solution.—*Linda Custer*

Mouse Exchange BBS
Dreams of the Phoenix
P.O. Box 10273
Jacksonville, FL 32247
904/396-6952
List price: $39.95

Paint-by-Menus

Quick, list four things *MacPaint* can't do. Although it's an excellent freehand drawing program, many people complain that *MacPaint* doesn't rotate objects in small increments, draw curved lines, or provide a visible, resizable grid. Perhaps the most common complaint is that the artist is restricted to drawing in *MacPaint*'s small window, and is therefore hampered when working on a full-page image. Just try drawing a circle that's larger than the *MacPaint* window, for example.

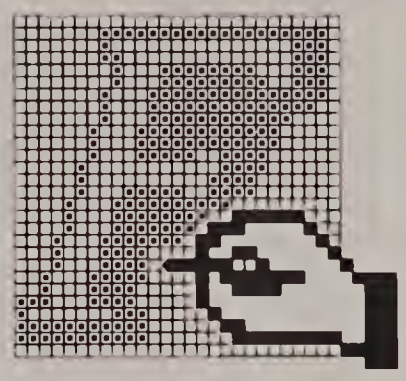
If you've voiced any of these complaints, you might find that Reas'nable Software's ***4paint,*** when used in conjunction with *MacPaint,* fills some gaps in the latter. *4paint,* an object-oriented drawing program that runs on a 128K Mac, allows you to create line drawings on a scaled-down representation of an 8½- by 11-inch page and then transfer the drawings to *MacPaint* to enhance them there (see "Full-Page Outline"). In short, *4paint* provides a full-page sketchpad in which to rough out large drawings. *4paint* has limitations of its own: it lacks an eraser, a paintbrush, patterns, and a text option. But a *4paint* drawing is intended to be a pencil sketch that can later be converted to a full-fledged drawing in *MacPaint.*

Movers and Shapers

4paint's Draw menu offers five drawing elements: a straight line, a curve, a rectangle, a rounded rectangle, and a circle. Shapes and lines can be drawn in line widths from 1 to 8 pixels, giving you more flexibility than *MacPaint*'s line-width fea-

(continues on page 166)

YOUR FACE STANDS OUT IN A CROWD.



With Fontastic, your typeface will be unique. Because you can create totally different fonts easily.

Fontastic unleashes your creativity. And lets you style, edit and scale any existing fonts. As well as cut and paste characters within or between fonts. All with more convenience than you've ever known.

Fontastic. The Macintosh™ font editor that offers you versatility the easy way.

And the kind of face that gets you the attention you deserve.

Fontastic™

Macintosh™ font editor

$49.95 — includes shipping (Add $8.00 for airmail outside U.S.) MasterCard, Visa, or personal checks accepted.

Fontographer™, our professional font editor for the LaserWriter, is now available

Altsys corp.

P.O. Box 865410
Plano, TX 75086 • (214) 596-4970

Circle 227 on reader service card

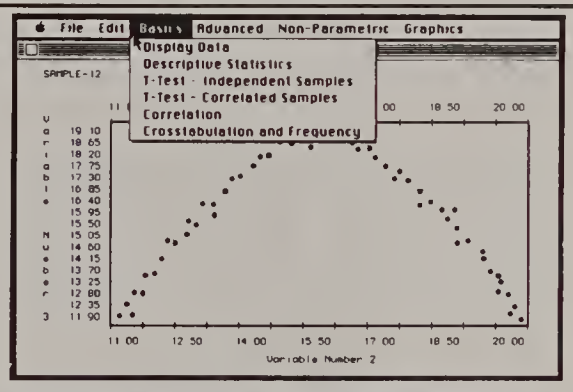
New Release: 2.0

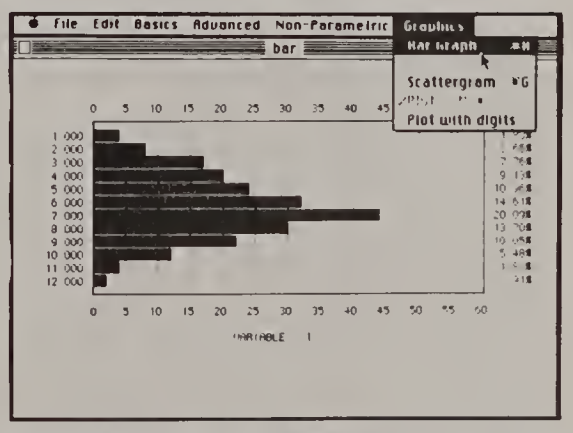
BUSINESS • SCIENCE • EDUCATION

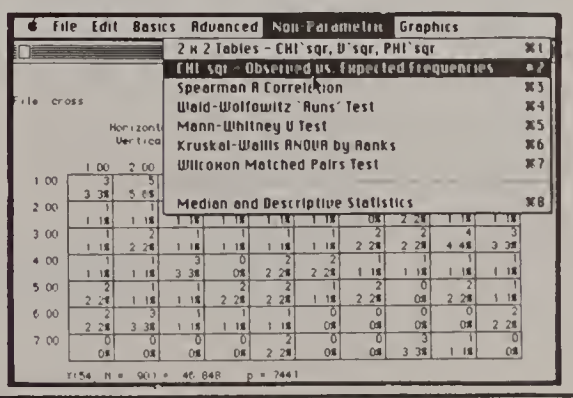
A complete statistical package for only:

STATFAST™ $119

A Powerful Tool for Data Analysis and Forecasting







- Very easy to use, even for novices. No commands to memorize
- Speed is a crucial issue in statistics: STATFAST is a professionally designed superfast stand-alone application **(it completes in seconds what takes BASIC or Pascal program 20 minutes or more)**
- Unlimited size of data files!
- Descriptive Statistics, t-tests (indep./dep. samples), Correlations, Crosstabulation, Frequency, 10 Nonparametric Statistics, Multifactor Analysis of Variance/Covariance (up to 5 factors [including a covariate], Repeated Measures, Unbalanced Designs, Contrasts), Multiple Regression (up to 50 predictors, Durbin-Watson statistic, autocorrelation of residuals, forecasting subprogram, plots of residuals, and more), Significance Tests, and much more
- Double precision calculations
- User defined (multiple) conditional selection of sub-sets of cases, various ways of treating missing data
- Two flexible Data Editors (command- and screen-oriented), easy entering/editing, "copying", "pasting" of data, complex (conditional) transformations, sorting, and more
- Can also access files created by spreadsheets (e.g. Multiplan, Jazz), data bases, and from mainframes
- Graphics, clear comprehensive output, can be "pasted" into MacWrite or MacPaint documents
- Clear, comprehensive manual, with step by step examples
- Requires 128k or 512k Macintosh®, external disk drive or hard disk supported but not required

To order send check or money order for $119 (plus $5.00 shipping and handling) to:

MasterCard VISA

StatSoft™

2832 East 10th Street, Suite 4, Tulsa, OK 74104. (918) 583-4149

Circle 225 on reader service card

CompuCover®

COVER YOUR INVESTMENT

DUST COVERS

Macintosh CRT & Keyboard	12.95
Macintosh CRT & Keyboard & Mouse	13.95
Macintosh Disk Drive or Floppy Drive	5.95
Macintosh Plus Keyboard	6.95
Macintosh CRT & MAC Bottom Disk	15.95
Macintosh Laser Jet Printer	10.95

DISK WALLETS

3½" Disk for 20 Disks	16.95
3½" Disk for 10 Disks	14.95
3½" Disk for 6 Disks	9.95

Anti-Static-different colors

ORDER LINE
1-800-874-6391
FLORIDA ORDER LINE
1-800-342-9008
Dealer Inquiries Invited

CompuCover
P.O. Box 310 Dept. M
Mary Esther, FL 32569

Customer Service
(904) 243-5793
Telex 469783

Circle 496 on reader service card

Imagine what it would be like to live with painful stomach cramps and terrible diarrhea. Forever.

More than 2 million men, women and children do just that. They have Ileitis and Ulcerative Colitis, intestinal diseases that strike at any age, and often require hospitalization for weeks—even months.

Please help us in our fight to find a cure for these devastating and misunderstood diseases.

Because when you suffer from something that many people acknowledge with only snickers and whispers, it's easy to mistakenly begin hating yourself as much as you hate your disease.

The National Foundation for
Ileitis & Colitis

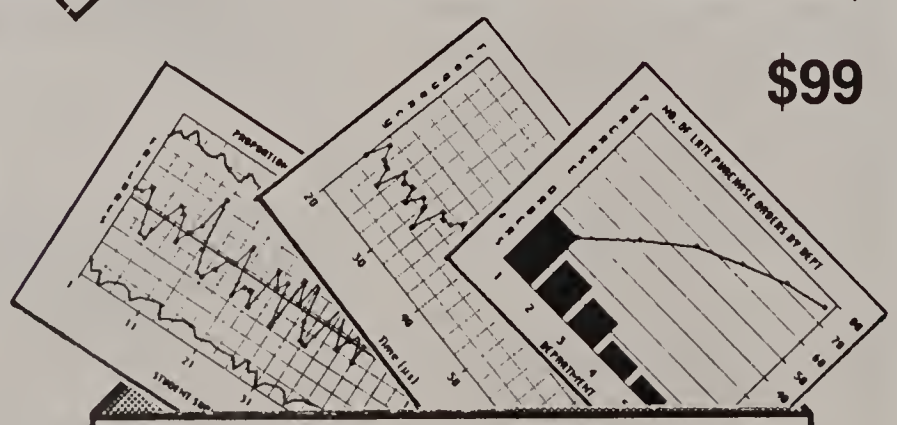
To send your tax-deductible contribution or for more information, please write: N.F.I.C., P.O. Box 2020, Murray Hill Station, New York, NY 10156

PROCESS CONTROL CHART TOOL KIT

OTHER PRODUCTS
- Engineering Tool Kit
- Stats Tool Kit
- Biomedical Research Chart Tool Kit

- Control Charts -P, NP, U, C
- $\overline{X}$R Charts
- Trend Charts
- Histograms
- Scatter Plots
- Pareto Charts
- MSBasic 2.0 req'd

$99



Sof-Ware Tools
P.O. Box 8751 • Boise, Idaho 83707
(208) 343-1437

Circle 247 on reader service card

(continued from page 164)

ture. Each element has three handles that let you move the element around on the screen, stretch or shrink it, or rotate it around a center point. Elements can be grouped, allowing you to move or rotate a conglomeration of elements as a single unit. Unlike *MacPaint,* which rotates selected objects 90 degrees at a time, *4paint* rotates single or grouped objects in increments of less than 1 degree. In addition, you can tilt an entire drawing at an angle simply by selecting a menu item and dragging the drawing.

In addition to drawing circles and ellipses, *4paint* draws curves and arcs. Selecting New Curve from the Draw menu gives you the raw material for a curved line: a U-shaped curve with four shaper handles. The shapers can be dragged in any direction to produce a variety of curves, including S-shaped curves.

Axes Mark the Spot

4paint's grid fills another of *MacPaint*'s holes. While *MacPaint* provides an invisible 8- by 8-pixel grid, *4paint* offers a multitude of grid options. You can specify increments that range from ⅛ inch to 24 inches for the x axis, the y axis, or both. The grid can be hidden or visible and can be turned on or off at any time. A Snap to Grid option causes line or shape elements to jump to the nearest grid intersection. If you scale or tilt a drawing, the grid scales or tilts accordingly.

4paint's manual is on the informal side (the Revert command, for example, is described as "a sort of super-undo for when things get really screwed up"), but it manages to adequately explain how the program's various features work. *4paint* is not as sophisticated as drafting programs like *MacDraw* or *MacDraft,* but if you need a flexible grid, curved lines, and the ability to work on a full-sized page, then $39.95 is certainly a reas'nable price to pay for enhancing *MacPaint*'s abilities.
—Gerry Kane

4paint
Reas'nable Software
779 11th St.
Idaho Falls, ID 83401
208/529-0378
List price: $39.95 □

TRY IT FIRST

SOFTWARE LIBRARY

FREE $20 Membership

RENTAL APPLIES TO PURCHASE

	Rent	Sell
Dollars & Sense	$ 17.99	$ 82.77
MacSpell+	13.36	61.47
Dinner at Eight	8.99	37.22
MS Word, File or Plan	26.32	121.09
Mac3D	26.91	123.78
SideKick	11.46	52.71
Gato	8.99	31.01
Omnis III	66.82	307.39
ReadySetGo 2.1	29.25	134.55
ThunderScan	40.00	184.00
Easy3D	13.36	61.47
MacDraft	32.98	151.70
Deluxe Music Const. Set	8.99	34.50
FileMaker	26.32	121.09
Tempo	13.66	62.83
TurboCharger	12.82	58.99
Speller Bee	11.99	55.16
Speed Reader II	9.44	43.43

500 Programs Available

SONY 3.5" DISKS SINGLE SIDE D/D .... $1.79 ea.
100+ DISCOUNTS

IMAGEWRITER RIBBONS
$3.15 Black $4.25 Color

SOFTWARE LIBRARY

Monday - Friday 9-6
P.O. Box 66754 • Houston, Tx 77266
Texas Residents & Information
(713) 622-1100
YOUR MAC WILL FLIP

ORDER HOTLINE 1-800-847-5775 MasterCard CHECKS WELCOME VISA

MACINTOSH PLUS DUPLICATION & PROTECTION NOW AVAILABLE!

Disclone Service Won't Make You Nervous

Technical support, personal service, competitive prices.

Disclone full service quality tested diskette duplication, packaging, documentation production and processing ensures precise duplication, thorough quality control, and expedient response to your requirements.

NOclone state of the art hardware based copy protection is true piracy protection for authorized allotments only. Each application is uniquely encrypted. Install routines are coded for nontransferrable hard disk allotments.

Committment dates are guaranteed. Fast turnover

- up to 1000 in 24 hours, any format.
- up to 10,000 in one week, any format.

disclone

DISCLONE SOFTWARE PRODUCTION SERVICES
1050 North Fifth Street, San Jose, California 95112
(408) 947-1161 OUTSIDE CA: 1-800-826-4296

Circle 465 on reader service card

Mac Disks

Upgrades:

128-512k $125
512-1024 $285
128-1024$379
180 Day Warranty

Mac Bottom 20$995

Haba 800K $259
Disk Drives
Haba 1200 $169
Baud Modem
100% Hayes Compatible

Mouspad by Moustrak 7.95
The Mouse mover 12.95

The Pocket Pak 7.95
The Easel 13.95

Black Ribbons 3.95
Color Ribbons 4.95

Tempo 65	StatView 109
MacInTax 57	StatWorks 89
MacSpell+ 65	Easy 3D 67
Copy II Mac 18	MacGolf 39

Visa, Mastercard,C.O.D. Texas Residents add sales tax
$30 Minimum on all orders.Shipping minimum 3.00 additional.

1(800) MAC-DISK

In Texas or for Info. (512) 473-8393
Vision Technologies Inc.
2200 Guadalupe St. Austin Tx 78705

Circle 459 on reader service card

Concerned about the damaging effects of excessive heat and power line disturbances?

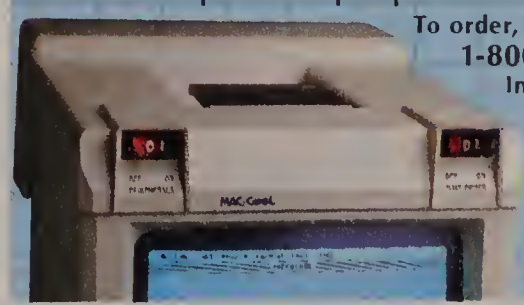
MACBCOOL™

Not just another fan!

Cooling is essential for optimum Mac operation. MACBCOOL™ cools your Mac better. Its whisper quiet fan circulates more than 20 cubic feet of air per minute through your Mac utilizing all top vents. That's plenty of cooling . . . even if you pack your Mac with hard disks and tons of RAM!

Surge energy protection is a must for your Mac too! MACBCOOL™ offers premium quality surge suppression and line filtering as protection against power line disturbances which can cause permanent damage to sensitive computer components.

And, MACBCOOL™ gives you added convenience with its easy to reach, front mounted switches to power up your Mac and up to two peripherals.



To order, see your local dealer or call:
1-800-231-2401
Inside California:
818-442-7829

MPH COMPUTER PRODUCTS

Circle 291 on reader service card

PC NETWORK

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 14-30 DAY SOFTWARE RENTALS†...

Every few months, *The NETWORK* saves its members more than $24,000,000 and processes over 100,000 orders.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns *including some of the most important names in the computer industry:*

AT&T	*General Motors*
Barclays Bank	*Gillette*
Bell & Howell	*Hewlett Packard*
Citibank	*Hughes Aircraft*
Columbia University	*IBM*
Data General	*ITT*
Exxon	*Kodak*
Farm Bureau Insurance	*United Nations*
Frontier Airlines	*University of Illinois*
General Mills	*Yale University*
General Electric	*Veteran's Administration*

plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and value-wise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE
1-800-621-S-A-V-E

(Orders—Membership and Advice!)
In Illinois call (312) 280-0002
Your Membership Validation Number U756

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable sales consultants are on duty Mon.-Fri. 8:00 AM to 7:00 PM, SAT. 9:00 AM to 5:00 PM CST.

PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!
Customer Service and Order Status (312) 280-1567
8:30 AM to 4:30 PM, Mon.-Fri. CST

*Members pay 8% above this wholesale price plus shipping.

INFOCOM
Available for Apple II & Mac
$19.75* $19.75* $21.50*

Living Videotext
THINKTANK™
128K Version . . . $ 66.00*
512K Version . . . 108.50*

MONOGRAM
DOLLARS AND SENSE
for the MAC
$70.00*

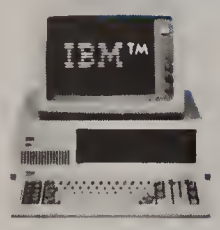
ProVUE™
OverVUE
$130.00*

HAYDEN
Videoworks or Musicworks
$50.00*

SOFTECH MICROSYSTEMS
MAC ADVANTAGE: UCSD Pascal
New Lower Prices!
$37.00*

ORGANIZATIONAL SOFTWARE
OMNIS 3™
$225.00*

IBM PC HARD DISK SYSTEM



IBM PC w/256K Floppy Drive Controller 1 Double Sided Double Density Disk Drive Half Height 20MB Disk Subsystem

CALL FOR LATEST IBM ANNOUNCEMENTS

CUSTOM CONFIGURATIONS WELCOME

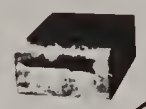
$1,690.00*

MACINTOSH 512K/1MB SYSTEMS

800K Disk Keyboard Mouse Software

Price Too Low To Print!!!

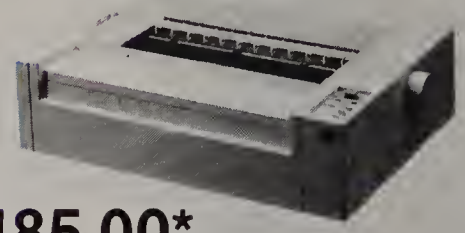
APPLE MACINTOSH



800KB External Disk Drive
$349.95*

haba
800KB Double Sided Macintosh Add On Disk Drive
$249.95*

APPLE 15" WIDE IMAGEWRITER
with MAC Accessory Kit



$485.00*

MICROSOFT
(At Unheard of Prices!!!)

Multiplan, File or Word	$102.00*
BASIC	79.00*
Chart	66.00*

THUNDERWARE
ThunderScan II
$155.00*

Koala
MacVision
$150.00*

PRENTICE® POFCOM

1200BPS Fully MAC Compatible!
Includes *Free* Dow Jones *Straight Talk Terminal Software* and Time on News Service
$245.00*

APPLE

Mac Terminal
Mac's Most Popular Communication Package
$65.00*

Mac Draw
Apple's Most Complete Design Package for the Mac
$125.00*

3½" SSDD
$15.95*
Box 10
Free Flip and File Case

DISKETTES
Guaranteed for Life
Brand name diskettes available in Boxes of 10

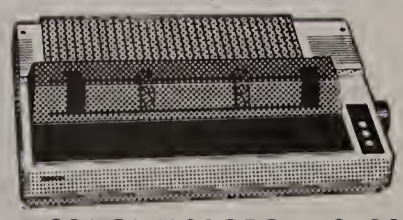
CENTRAL POINT Software
Copy II Mac
$20.00*

BORLAND INTERNATIONAL
SideKick
$37.50*

First Byte®
Smooth Talker
$44.00*

Creighton Development
Mac Spell +
$44.50*

EPSON® PRINTERS
Unbelievable Low Prices!!!



LX-80	80COL/100CPS . .	$199.00*
FX-85	80COL/160CPS . .	299.00*
FX-286	132COL/200CPS . .	459.00*
LQ-1000	132COL/180CPS . . .	CALL

MILES Computing
Harrier Strike Mission
Jet Simulator for Mac

GATO
WW II Submarine Simulation for The Mac

Each **$22.00***

$318.00*

MICROSOFT
EXCEL
$208.00*

Wholesale Prices Change Rapidly...if you ever see a lower price advertised anywhere please call! You will find the Network's Price will always be the best!

Now you can store twice as much data as a single sided Macintosh drive with the HABA

DISK 800™

PC NETWORK
BEST BUY

- *Double Sided Disk Drive for/800K Memory*
- *Automatic and manual eject control*
- *Just Plug it in and go*

Wholesale price

$249.95*

Haba

**Members pay Wholesale + 8% and shipping. All Prices subject to change without notice.*

PC NETWORK • MEMBERSHIP APPLICATION

YES! Please enroll me as a member in the PC NETWORK™ and send my catalog featuring thousands of computer products, all at just 8% above DEALER WHOLESALE PRICES. I will also periodically receive "THE PRINTOUT", a special up-date on merchandise at prices BELOW even those in my wholesale catalog, and all the other exclusive, money-saving services available to Members.

I am under no obligation to buy anything. My complete satisfaction is guaranteed. ☐

Please check (✓) all boxes that apply: **756**

● Basic Membership
With 14 Day Rentals

- ☐ One-year membership for $8
- ☐ Two-year membership for $15 (SAVE $1)
- ☐ Business Software Rental Library for $25 add'l. per year—members only
- ☐ Games Software Rental Library for $10 add'l. per year—members only

● Special V.I.P. Membership
With 30 Day Rentals

- ☐ One-year membership for $15
- ☐ Two-year membership for $25 (SAVE $5)
- ☐ BOTH Business and Game Software Rental Libraries for $30 add'l. per year—V.I.P. members only

☐ Bill my credit card: ☐ VISA ☐ MasterCard ☐ American Express

Account Number: _____ Exp. Date _____ mo. year

☐ Check or money order enclosed for $ _____.

Name _____

Address _____ Apt. No. _____

City _____ State _____ Zip _____

Telephone (_____) _____

My computer(s) is: ☐ IBM PC ☐ IBM-XT ☐ IBM-AT ☐ Apple II ☐ Macintosh ☐ Other _____

Signature ✓ _____

(Signature required to validate membership) Copyright © 1985, PC NETWORK INC.

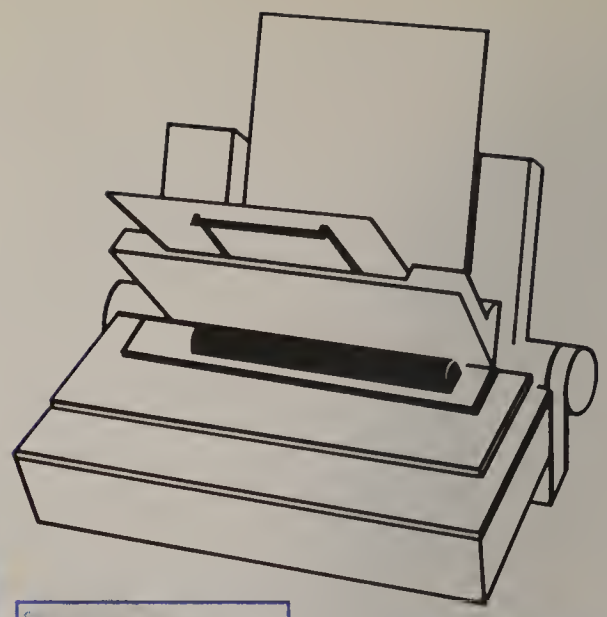
IMAGEWRITER II
For the Macintosh

- *Prints up to 7 colors.*
- *Slope Design for easy reading.*
- *Prints 250 CPS.*

Wholesale Price

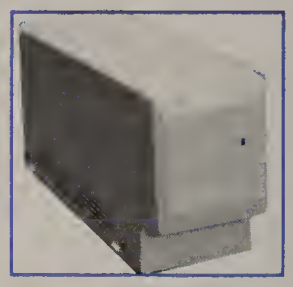
$419.00*

Automatic Sheet Feeder **$149.00***



	Wholesale Price
• Prentice® Popcom™ 1200 Baud Modem	$219.00*
• Smartcom II Communications Software	$74.95*
• Ready Set Go Page Processor	$74.95*

**Members pay wholesale + 8% and shipping.*
All prices subject to change without notice.



Paradise 10MB Hard Disk

• Designed for the Mac

Wholesale Price

$569.00*

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

First Class Permit No. 14823 Chicago, IL

POSTAGE WILL BE PAID BY ADDRESSEE

PC NETWORK
320 West Ohio
Chicago, Illinois 60610

PC NETWORK

...AS A PC NETWORK MEMBER ONLY!

Listed below are just a few of the over 30,000 products available at our EVERYDAY LOW PRICES!

GAMES & EDUCATIONAL

(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
Apple *Mac Challenger*	$19.25*
Aegis *Pyramid of Peril*	13.50*
Bluechip *Baron Millionaire Tycoon*	24.50*
Broderbund *Lode Runner*	20.00*
Expertelligence *ExperLogo*	65.00*
1st Byte *Smooth Talker*	44.00*
Great Wave *Concertware Plus*	31.00*
Hayden *Videoworks or Musicworks*	50.00*
Hayden *Sargon III*	24.75*
Hayden *DaVinci—Houses Interiors or Landscapes*	24.75*
Hayden *Art Grabber*	24.75*
Infocom *Deadline Suspended*	24.00*
Infocom *Enchanter Planetfall, Cutthroats*	19.75*
Infocom *Zork II, Zork III*	21.50*
Infocom *Zork I Witness, Ballyhoo*	19.75*
Infocom *Suspect Infidel, Sorcerer*	21.50*
Infocom *Hitchhiker's Guide Seastalker*	19.75*
Magnum *McPic! Volume 1 or 2*	24.75*
Magnum *The Slide Show Magician*	29.75*
Mark of the Unicorn *Mouse Stampede*	17.50*
Miles Computing *Mac the Knife*	17.50*
Miles Computing *Mac Attack*	22.00*
Miles Computing *Harrier Strike Mission*	22.00*
Mindscape *James Bond: A View to a Kill*	19.75*
Mindscape *Rambo: First Blood Part II*	19.75*
Palantir *Mac Type*	23.50*
Penguin *Graphics Magician—Mac Only*	28.97*
Scarborough *Mastertype*	19.75*
Sierra On-Line *Championship Boxing*	19.75*
Sierra On-Line *Frogger*	20.00*
Silicon Beach Software *Airborne!*	15.50*
Simon & Shuster *Typing Tutor III*	28.25*
Simon & Shuster *Paper Airplane Construction Set*	19.75*
Sir-Tech *Wizardry I*	29.75*
Telarium *Amazon, Dragon World, Farenheit 451*	20.95*
T/Maker *Click Art*	25.00*
Videx *Fun Pack*	19.25*

BUSINESS SOFTWARE

(Please add $2.50 shipping and handling for each title ordered from below.)

Advanced Logic Systems *Mighty Mac*	$31.00*
Apple *MacTerminal*	65.00*
Apple *MacPascal*	85.00*
Arrays *Home Accountant*	65.00*
Borland *SideKick for Mac*	37.50*
Boston Software *MacPublisher*	65.00*
Creative Solutions *MacForth Level I*	65.00*
Creative Solutions *MacForth Level II*	110.00*
Desktop Software *1st Base*	90.00*
Dilithium *PC to MAC and Back w/cables*	90.00*
Dow Jones Software *Straightalk*	40.00*
Dow Jones Software *Market Manager+*	86.75*
Dow Jones Software *Spreadsheet Link*	43.50*
Funsoft *Macasm*	60.00*
Haba *Habadex*	40.00*
Harvard *MacManager*	29.95*
Hippopotamus Software *Hippo-C Level 1*	67.00*
Hippopotamus Software *Hippo-C Level 2*	176.00*
Layered Software *Front Desk*	66.00*
Living Videotext *ThinkTank (128 K VER.)*	44.00*
Living Videotext *ThinkTank (512K VER.)*	86.00*
Main Street *Main Street Filer*	67.00*
Megahouse *Megafiler*	85.00*
Microsoft *Basic*	79.00*
Microsoft *Chart*	79.00*
Microsoft *Excel*	208.00*
Microsoft *File*	102.00*
Microsoft *Word*	102.00*
Microsoft *Logo*	66.50*
Odesta *Helix Reg's 512K Mac*	195.00*
Organizational *OMNIS 3*	225.00*
Paladin *Crunch*	147.00*
Palantir *G/L, A/P, INV Each Only*	64.00*
Peachtree Software *G/L, A/P, A/R Each Only*	77.00*
Provue *Overvue*	130.00*
Rio Grande Software *Softmaker II*	85.00*
Soft Design *Time Base*	75.00*
Softsync *The Personal Accountant*	42.00*
Softtech Microsystems *USCD Pascal*	37.00*
Software Publishing *PFS File or Report*	68.00*
Stoneware *DB Master*	95.00*
Telos Software *Filevision*	85.00*
Tronix/Monogram *Dollars & Sense*	72.00*

HARDWARE

(Add 2% to the member price for each item for shipping and handling.)

COMPLETE SYSTEMS

Apple *Macintosh Base Systems*	CALL	
Apple *Apple IIc*	CALL	
Apple *Apple Apple IIe*	CALL	
AT&T *6300 PC CPU2 128K/2 Floppy/1 Serial/1 Parallel*	$1,575.00*	(34.02)
COMPAQ *Desk Pro System with Tape Backup w/640K/1 Floppy/10MB Hard Disk/ 10MB Tape Drive/Monitor*	2,446.00*	(61.11)
▶**COMPAQ** *Hard Disk Portable 10MB Hard Disk 1 Floppy 256K*	CALL	
▶**IBM** *PC Base System 2 DSDD FDC 256K*	1,325.00*	(28.62)
▶**IBM** *PC Professional Hard Disk 1 DSDD FDC 10MB Hard Disk 256K)*	1,620.00*	(34.99)
▶**IBM** *PC AT Base System 1.2 MB Floppy 256K*	2,875.00*	(60.37)
IBM *PC/AT At All Configs*	CALL	
Texas Instruments *Professional*	CALL	

DISK DRIVES

Apple *800KB External Drive*	$349.95*
Corvus *5.5 MB Hard Drive*	939.00*
Haba *800KB Double Sided Macintosh Add on Drive-Twice the Capacity! Reads Standard Disks!*	249.95*
IOMEGA *5MB Bernoulli Box*	1,250.00*
Paradise *10MB Hard Disk & Subsystem*	969.00*
Tecmar *5MB Removable Drive*	999.00*
Tecmar *10MB Mac Drive*	999.00*

MODEMS

Apple *Modem 300*	$169.00*
Apple *1200 BPS Personal Modem w/Kit*	275.00*
Compucable *Mac to Smartmodem Cable*	16.00*
Hayes *Smartmodem 1200*	340.00*
Hayes *Smartmodem 2400*	525.00*
Microcom *Mac Modem*	360.00*
Prentice *Pop Com Mac Pack 1200 Baud Modem, Cable, Straightalk*	245.00*
Prometheus *Promodem 1200 w/Mac*	299.00*
U.S. Robotics *Password LOWEST PRICES 1200 BPS Available!*	195.00*
U.S. Robotics *Courier 2400 BPS Modem*	395.00*

PRINTERS

Apple *Imagewriter II 10" Carriage 250 CPS/45 CPS N LQ/Color Capable*	$ 419.95*
Apple *Imagewriter 15" Carriage (with Mac kit)*	485.00*
Apple *Laser Writer Turns the Mac into a typesetter!*	4,895.00*
Epson *DX-35 New! Daiseywheel printer 33CPS/132COL/True Letter Quality*	569.00*
Epson *LX-80 10"Platen 100CPS*	199.00*
Epson *FX-85 10"Platen 160CPS*	299.00*
Epson *FX285 New! 15"Platen 200CPS NLQ*	459.00*
▶**Epson** *LQ-1000 New! 180CPS/60CPS NLQ*	CALL
Hanzon *Hanzon Board turns your Epson into an Imagewriter*	60.00*
NEC *3510 33CPS Letter Quality Printer*	960.00*
NEC *8810 55CPS Letter Quality Printer. Both these printers are compatible with Microsoft Word!*	1,275.00*
Okidata *ML-192/Mac/Apple New Slimline Design/10" Platen/160CPS/Imagewriter Look-Alike*	CALL
Okidata *ML-193/Mac/Apple New Slimline Design/15" Platen/160CPS/Imagewriter Look-Alike*	CALL

ACCESSORIES

(Freight minimum $1 per item)

Apple *Macintosh Carrying Case*	$69.00*
Apple *Macintosh Security Kit*	29.00*
Apple *Numeric Keypad*	69.00*
Assimilation Process *Mac•Turbo•Touch*	73.50*
Innovative Concepts *Flip N File II*	28.08*
Innovative Concepts *Flip N File Micro (25)*	6.69*
Kensington *Disk Case*	16.50*
Kensington *Dust Cover*	6.75*
Kensington *Starter Pack*	49.00*
Kensington *Surge Protector*	29.50*
▶**Koala** *MacVision*	150.00*
Maxell *Mac Diskettes (Box of 10)*	29.95*
Mouse Systems *A+ Mouse*	55.00*
PC Network *Mac Diskettes (Box of 10) Includes Free Flip N File*	15.95*
PC Network *Imagewriter Ribbons (Per 12)*	36.00*
▶**Thunderware** *Thunderscan Turns your Imagewriter into an Optical Digitizer*	155.00*
Sony *3.5" Diskettes (Box of 10)*	19.00*
WP Printer Paper *2600 Sheets Microfine Perfs*	17.00*

***PC Network Members pay just 8% above the wholesale price, plus shipping.** All prices reflect a 3% cash discount. Minimum shipping $2.50 per order. International orders call for shipping and handling charges. Money Orders, personal and company checks please allow 10 working days to clear. All prices subject to change without notice!

CALL TOLL FREE 1-800-621-S-A-V-E (orders and memberships)

In Illinois call (312) 280-0002 validation code U756

Customer Service and Order Status (312) 280-1567

...WITH THESE 15 UNIQUE BENEFITS

1 COST + 8% PRICING—The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available **and all at just 8% above published dealer wholesale price.**

2 OUR 600 PAGE WHOLESALE CATALOG—Members receive our 600 page wholesale catalog containing over 30,000 hardware and software products for the *IBM PC, APPLE* and over 50 other popular computer systems. **THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY. NOW UPDATED QUARTERLY!**

3 IN-STOCK INSURED FAST HOME DELIVERY—The NETWORK maintains a **giant multi-million dollar inventory of most popular products,** allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. **EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.**

4 10 DAY RETURN POLICY—If you are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.

5 MEMBERSHIP SATISFACTION GUARANTEE—If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

6 EXPERIENCED CONSULTANTS—The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possesses in excess of 150 man years of personal computer product experience. **We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED—WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.**

7 FREE TECHNICAL SUPPORT—The NETWORK supports every product it sells. Our qualified TECH-SUPPORT staff will help you assemble your system, interpret vendor documentation and get your software and hardware to work. **WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT—FREE!**

†8 OPTIONAL BUSINESS RENTAL LIBRARY—All members can join our BUSINESS RENTAL LIBRARY ***featuring over 1000 available titles*** for just $25 PER YEAR above the base membership fee. **This entitles you to rent business software AT JUST 20% of the DISCOUNT PRICE FOR A 14 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 30 DAYS for just $30 above the V.I.P. base fee. This also includes the game library privileges for a $5 combination savings.**

†9 OPTIONAL GAME SOFTWARE RENTAL LIBRARY—The Game Rental library is available to members for just $10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above

10 SPECIAL SAVINGS BULLETINS—THE PRINTOUT—Issued Quarterly at no charge to Network members only! The Printout contains all the New Product listings and price changes you need to keep your Catalog up to date. Also, we buy excess dealer inventories, and store bankruptcy closeouts, which we turn around and make available to our members at fantastic savings via *THE PRINTOUT.*

11 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

12 MEMBERSHIP REFERRAL BONUS—Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

13 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left).* The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

14 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 PRICE PROTECTION—The PC Industry is crazy!! Prices change not yearly or monthly or even weekly but often day by day! These changes are sometimes up *but are mostly down!!!* **THE NETWORK GUARANTEES THAT IN THE EVENT OF A PRODUCT PRICE REDUCTION, BETWEEN THE TIME YOU PLACE YOUR ORDER AND THE TIME THE PRODUCT SHIPS YOU WILL ONLY PAY THE LOWER AMOUNT!!**

Circle 45 on reader service card

5 good reasons to attend the MACWORLD Expo®—

The Original Macintosh™-Exclusive Computer Show

1. **See and touch the latest Macintosh products.** Visit hundreds of exhibits and see the newest hardware, software and peripherals available for the Macintosh.

2. **Save time and money.** Attend the Macworld Expo in the city that's convenient for you — Boston, Dallas or San Francisco.

3. **Pick from dozens of tutorial sessions.** No matter where you use your Macintosh — in the office, at school or at home, you'll be able to choose the session that's best for you.

4. **Pinpoint new areas for increasing your profits.** If you develop, produce or sell Macintosh products, the Industry Sessions are your opportunity to hear the latest on industry trends.

5. **Apply your expertise right on the spot.** Use one of the many Macintoshes available to test and fine-tune your skills.

This is the original Macintosh-exclusive computer show bringing you a world of Macintosh knowledge not available anywhere else!

Sponsored by MACWORLD, the Macintosh™ Magazine.

Mark these dates on your calendar:

Boston
August 14-16, 1986
Bayside Expo

Dallas
October 16-18, 1986
Market Hall

And, returning to Brooks Hall in San Francisco — January 15-17, 1987!

For further information on the upcoming Macworld Expos, just fill in the coupon below and return it to us. Or call us at 617-329-7466.

Macworld Expo is a registered trademark of World Expo Co. Macintosh is a trademark licensed to Apple Computer, Inc.

☐ **Yes, I want to learn more about the Macworld Expos. Please send me:**

- ☐ Exhibiting information.
- ☐ Attendee information.

For the following Macworld Expos:

- ☐ **Boston,** August 14-16, 1986
- ☐ **Dallas,** October 16-18, 1986
- ☐ **San Francisco,** January 15-17, 1987

Name _____

Company _____

Street _____

City/State/Zip _____

Phone _____

Send this coupon to Macworld Expositions, Mitch Hall Associates, P.O. 155, Westwood, MA 02090

Macworld Directory

The Macworld Directory is a comprehensive listing, by category, of products and services available for the Apple Macintosh. It provides advertisers with a low-cost advertising alternative and our readers with an easy reference guide.

FORMAT: The standard format includes a product ID, a 300-character descriptive ad, and a company name, address, and telephone number.

Advertisers may choose among categories already in use, or they may create their own. Display advertisers can cross-reference their current ad to the Macworld Directory for increased exposure.

RATES: Listings are accepted for a three-time consecutive insertion at a rate of $726. We offer a six-time insertion at $1230 that reflects a 15% frequency discount. Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, Visa, and MasterCard are accepted.

DEADLINE: For copy deadlines and further information please contact Niki Stranz, your Macworld Directory Account Manager, at 415/861-3861 or 800/872-7800 (800/872-7808 in California). Please send copy and prepayment to the Macworld Directory, 555 De Haro St., San Francisco, CA 94107.

■ *Accessories*

○ *Index*

Quarterly Macworld Index
Now you can find any article, column, or product review that runs in *Macworld*. A complete quarterly index ends searching thru back issues for the info you need on Mac products, applications, software. Our index covers every *Macworld* ever published. Makes *Macworld* a Mac Library. Only $3.95/ea., $12.95/yr.
Indexmasters, P.O. Box 520337, Salt Lake City, UT 84152

○ *Cables*

Mac Products
MacLock secures Mac, keyboard, mouse, second drive, modem, & printer. Attractive red vinyl covered steel ⅛-inch cables. Lock included $40. Any length MacCables custom-connect any modem, printer to your Mac. Most $29. *Tax Master* prepares U.S. taxes w/ *Multiplan*. 25 forms. Some states. $99. *MacPlot* $130. $5 s/h. CA tax 6.5%
Mac Products, 20231 San Gabriel Valley Dr., Walnut, CA 91789, 714/595-4838

ImageWriter II/Mac Plus
Interface your Mac Plus, Macintosh, or IIe to the ImageWriter II printer or Apple Personal Modem with our Apple-equivalent custom *molded* cables, all at $27.95! Also available are Mac Plus-to-SCSI drive cables and Mac Plus-to-Macintosh adapter cables. Custom designs for OEM applications. Full line of all Apple printer/modem cables.
N² Products, Inc., 2401 Qume Dr., San Jose, CA 95131, 408/435-0227, 619/243-3632

○ *Supplies*

Free Mouse Pad
Try one *free sample* of EZ Mouse™ die-cut, self-adhesive, antifriction pad on the bottom of your mouse.
- Dramatically improves the feel on any surface.
- Eliminates wear on the bottom pins.
- Keeps mouse cleaner.
- Reduces wear on desk surface, too.

For free sample and details, write or call:
Hi-Tech Products, 8331 Artesia Blvd., Buena Park, CA 90621 714/670-2150

○ *Switches*

Mac A/B Switch
Switch conveniently between your letter-quality and Imagewriter printers with only a flip of a switch. Occupies only one port and provides instant access to either printer. Compatible with all LQ printers.

Complete with one cable	$99
Add'l cable for LQ printer (Std.)	$25
Add'l cable for LQ printer (API)	$39

Visa/MC welcome. See display ad in this issue.
Creighton Development, Inc., 714/472-0488

■ *Artificial Intelligence*

○ *Expert System Tools*

ExperOPS5: The Expert Maker™
Develop your own expert system with *Exper-OPS5*. Developed by Carnegie-Mellon University and implemented for ExperTelligence by SAIC, the program uses Macintosh-style menus and editing features. OPS5 has been widely used by major corporations for applications ranging from computer configurations to stock market analysis.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperFacts™
A flexible expert systems-building tool. Written in ExperLisp by MC-Systems™, *ExperFacts* features backward and forward chaining, meta-level control, partitioning of the knowledge base, and a software hook that runs any LISP function, including graphics!
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

○ *Languages*

ExperLogo
The ideal tool to experience AI concepts & transform your Mac into a fantastic image generator! 3-D & spheric coordinates; automatic conversion; Mac toolbox; control of menus, windows, etc. Because ExperLogo is compiled, it is fast & powerful. Used by professionals for 3-D animation & development of small expert systems. More than 5000 users! A new technology that you cannot afford to ignore. Call or write today. Visa/MC. Corporate, user groups, & education welcome.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperLogo–Talker/Prologo
A special implementation of ExperLogo that brings speech to your programs. Control pitch and speed; create incredible effects! On the

same disk an interpreter version of Prolog, the newest AI language. Implemented in ExperLogo. Includes source codes & numerous examples. A serious & fun professional product. Updates from ExperLogo avail. Call or write today. Visa/MC. Corporate, user groups, & education welcome.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperLisp: The AI Master
LISP is the most widely used AI language. It has been used to develop hundreds of expert systems all over the world. ExperLisp is the first compiled version available on the Mac. Includes all the Mac-style menus and editing features. Package includes *A Gentle Introduction to Symbolic Computation,* written by David S. Touretzky of Carnegie-Mellon University. A must for anybody interested in AI, from beginners to developers! Call or write today!
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperLisp-Talker
Create state-of-the-art talking expert systems: allows the integration of real-time text with speech synthesis in ExperLisp programs. Control speed, pitch, & rate. Includes sources for a talking version of the famous *Animal* program, detailed documentation, and examples. Call or write today. Visa/MC. Corporate, user groups, & education welcome.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

○ *Utilities*

ExperLisp-3600
A unique version of ExperLisp designed to optimally integrate ExperLisp with a Symbolics. A special feature, ExperLink™, supports remote procedure invocation and file transfer, plus the creation of a Mac-based Symbolics Listener window. The window allows programs from the ExperLisp editor to be remotely compiled on the Symbolics.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

■ *Business Opportunities*

Looking for a Publisher
for your Mac application? CSI, the publisher of many microcomputer software products would like to talk with you about publishing your innovative product ideas. Complete publishing services–documentation thru distribution. In-depth technical knowledge of the Mac. Flexible royalty %'s.
Creative Solutions, Inc., 4701 Randolph Rd. #12, Rockville, MD 20852, 301/984-0262

■ *Expert Systems*

MacKIT™ Version 2.0
The Knowledge Integration Toolkit for Building Expert Systems. This shell is written in FORTH as a turnkey application . . . FORTH not required. *MacKIT* features a production rule compiler, back-chaining inference engine, certainty factors. Not copy protected. 512K req. $149, demo disk $10. MC/Visa.
Knowledge System Environments Inc., P.O. Box 261, Dept. M3, Grantham, PA 17027, 717/766-4496

■ *Hardware*

○ *Bar Code*

Bar Code/MagCard Readers
The PC-380 Bar Code & PC-580 Magnetic Stripe (credit card) Readers have been designed to interface with the Apple Macintosh, are easily connected between the keyboard and the CPU, and require neither additional software nor an RS-232 port. A powerful but simple program for printing Code 39 bar codes is also available.
TPS Electronics, 4047 Transport St., Palo Alto, CA 94303, 415/856-6833

○ *Data Acquisition*

"Real World" Access
Add measurement and control capabilities to your Mac with the ADC-1. This easy-to-use RS-232 peripheral includes 16 analog inputs (13 bit), 4 digital inputs, 6 outputs, and a BSR controller. Used for laboratory, industrial, and home monitoring. $449. ADControl software $45. Sensors available.
Remote Measurement Systems, 2633 Eastlake Ave. E/206, Seattle, WA 98102, 206/328-2255

○ *Monitors*

MacMonitor $1295
23-inch hi-res monochrome monitor with antiglare makes viewing your Mac easy in classrooms, trade shows, seminars, offices. Horizontal scan rate is switch selectable: 15-25 kHz. Guess what else? MacMonitor works with Apple IIe, IBM PC, Amiga, etc. MacMonitor does it all. Ask about our Mac Projectors for $3995.
National Data Systems, 2419 Rutland Dr., Austin, TX 78758, 512/837-1760, 800/531-5143 (U.S.), 800/252-8286 (TX)

○ *Video Adapters*

Mentauris Corp.
Specialists in Macintosh video interfacing for over two years. Mentauris offers a wide range of products to satisfy any Mac or Mac Plus video interfacing need: our original, high-res Composite Video Adapter; our new, "no-drill" CVA; monochrome and color NTSC scan converters; Mac disassembly hand tools.
Mentauris Corp., 1658 IH 35 S, P.O. Box 1467, San Marcos, TX 78666, 512/396-1565

■ *Insurance*

Safeware
If your computer is important to you, insure it! SAFEWARE provides full replacement of hardware, media, & purchased software. As little as $39 a year covers fire, theft, power surges, earthquake, water damage, auto accident. Call 8 a.m. to 8 p.m. Mon. thru Fri.; Sat. 9 a.m. to 5 p.m.
Safeware, The Insurance Agency Inc., 2929 N. High St., P.O. Box 02211, Columbus, OH 43202, 800/848-3469 (Natl), 614/262-0559 (OH)

■ *Publications*

Microcomputer Books
Selected Macintosh titles include:
- *Basic Microsoft Basic* $16.95
- *Mac Revealed, Unlocking the Toolbox* $22.95
- *Microsoft Macinations* $18.95
- *Excel in Business* $20.95
- *The MacPascal Book* $14.95
- *Using the Macintosh Toolbox with C* $20.95
- *Jazz!* $14.95

S/h extra. MC/Visa/AE. Send for free Directory.
Micro Books, P.O. Box 4068, West Richland, WA 99352, 800/547-9755 ext. 8, 509/967-5084

Mac Artists
Do you miss *Macworld Gallery?* Do you have patterns or drawing tips to share? Send a B&W paper copy of your masterpiece (up to 8 by 10½ inches) with a description of how it was done & $20. Each entry will receive a copy of *Mac Artist* with his or her work in it! Nice prizes awarded to top entries. For a copy send $5.
Mac Artist, *12 Calvin Ct., Walnut Creek, CA 94595, 415/935-2270*

Mac Tricks
Only $14.95 postpaid, a handbook of hundreds of helpful tips to make your Mac more useful, fast, and fun. If you read ALL of the magazines, you've seen many, if you could only remember where?! Full table of contents and index, information arranged by application. Probably the best $15 you'll ever spend on your Mac. MC/Visa accepted.
Digi-Graphics, 764 E. Village Way, Kaysville, UT 84037, 801/544-2009

■ *Services*

○ *Data Conversion*

Electronic Data Conversion
Conveniently translate data files from dedicated word processors, phototypesetters, PC software (word processing, databases, spreadsheets including formulas) to your Macintosh or other system. Experience compatibility. Call or write, then send a sample disk or tape for a complimentary translation.
CompuData Translators, Inc., 6565 Sunset Blvd. #301, Hollywood, CA 90028, 213/462-6222

○ *Disk Duplication*

• Duplication
100% error free. Clean room environment. Quick turnaround.
- The Media–guaranteed for a lifetime. 8", 5¼", 3½" avail.
- Full Service–copy protection & serialization. Complete packaging & assembly. Int'l distribution. Dependable, personalized service.

Computer Media Products, 4760 Murphy Canyon Rd., San Diego, CA 92123, call collect 619/565-7802

○ *Graphics/Printing*

Save $$

Cut your printing and typesetting budget up to 80%! Mac and IBM disk or modem output on LaserWriter or professional-quality Linotype (1270 dots per inch). We specialize in newsletters, custom layout of your advertisements, logos, and business forms. Complete offset printing and bindery services available.
Laser Printing Services, 26058 W. 12 Mile Rd., Southfield, MI 48034, 313/356-1004

Laser Typesetting

Use your Mac for desktop publishing! Newsletters, brochures, and other graphics output at professional quality using your Mac and our Linotype™ typesetter or Apple LaserWriter. Great savings and 24-hour turnaround via disk or modem. Graphic design also available from our staff artists. Write or call:
Spectrum Arts, Ltd., 1823 Eutaw Pl., Baltimore, MD 21217, 301/225-7372

○ *Typesetting*

MacTypeNet

Professional typesetting services for the Macintosh. Text and/or graphics output at 300 to 2540 lines per inch resolution from Apple LaserWriter™ or Allied Linotype™ L300 laser typesetter. Disk and modem service. 24-hour turnaround. Full printing and bindery services. Write or call for user info.
MacTypeNet™, Box 52188, Livonia, MI 48152-0188, 313/477-2733

■ *Software*

○ *Accounting*

Shopkeeper

For retailers and service firms, Integrated Accounts Receivable, Billing, Inventory, Point of Sale, & Invoicing program. Use all or any parts. (880 customers, no limit inventory.) Written just for the Macintosh. Works with any general ledger system. For the 512K Macintosh with external or hard disk drive. $79.95.
Woodtec, 320 W. Maple, P.O. Box 445, Arkansas City, KS 67005, 316/442-7000

○ *Apple Emulator*

II in a Mac™

NOW!... Run Apple II™ software on your MAC, without hardware! *II in a Mac* simulates a 64K Apple II+ with 80-col full screen, including monitor and soft switch locations. *II in a Mac* comes COMPLETE with DOS 3.3, ProDOS, Integer/Applesoft BASIC, an Apple II transfer disk, and features like HiRes/LoRes graphics. Joystick and Desk Acc./SWITCHER support! Available NOW ... $69.95.
COMPUTER:applications, Inc., 12813 Lindley Dr., Raleigh, NC 27614, 919/846-1411

Mac + II

Mac + II is an ideal software package to run Apple II programs on the Macintosh. Mac + II emulates the Apple II (+, e, enhanced, 128K, 80 column) and runs AppleWorks and thousands of DOS 3.3, ProDOS, BASIC, and Apple II machine language programs. Easy transfer software is included. The best Apple II emulator on the market. $149.95. MC/Visa.
Meacom, P.O. Box 272591, Houston, TX 77277, 713/526-5706

○ *Architecture*

MacPerspective™

Allows architects, draftspeople, and artists to rapidly construct perspective drawings of houses, buildings, or other objects. Viewpoint can easily be changed. Drawings can be printed in any size up to 100 inches. Easy to learn and use. Fast, professional program with many features, thorough manual. $149.
B. Knick Drafting, 313 Marlin Pl., Melbourne Beach, FL 32951, 305/727-8071

○ *Backup Restore*

COPY II MAC

COPY II MAC backs up nearly all protected software easily! Allows running some directly from your hard disk—so put that original 3½" safely away. Repairs damaged disks and undeletes files too! For 128-512K Mac, 1-2 drives. $39.95 + $3 s/h ($8 overseas). MC/Visa/chk./c.o.d. (We also have backup programs for IBM, Apple, Comm 64/128!)
Central Point Software, Inc., 9700 S.W. Capitol Hwy. #100, Portland, OR 97219, 503/244-5728

○ *Business*

ZipFinder

Analyzes your mailing list files created with virtually any database program and automatically inserts the correct zip codes into the zip code fields. Also verifies existing zip codes on file and finds zips according to addresses entered by operator. Sold by state or partial state.
SoftIdea, 8177 S. Harvard #619, Tulsa, OK 74137, 918/745-9792.

MacAID Project +

This new product from CSSi uses *MacProject* output to enhance project monitoring and control for managers. Features include expanded reporting; actual vs. plan review; resource smoothing; flexible, easy input of "actual" project information. $99.95 (IL + 6%). Visa/MC. Inquiries invited.
Common Sense Software, Inc., 12 Whiteball Ct., Buffalo Grove, IL 60089, 312/541-5200

○ *Business Forms*

MacForms™ & DrawForms™

Business forms on disk. Invoices, purchase orders, statements, etc.
- Personalized with your logo
- Customized to satisfy your needs
- Fill out on Mac or by hand
- Print out and/or use copier
- Save on disk

MacForms for *MacPaint:* 4-disk set w/ 100+ financial, purchasing, inventory, personnel, time, & sales forms $79.95. *DrawForms* for *MacDraw:* 40+ popular forms providing easier data entry & editing capabilities. $59.
Datafood Software Co., 400 Country Dr., Ste. H, Dover, DE 19901, 302/736-9098

○ *Compilers*

MacLanguages Series Pascal

A complete native code Pascal compiler and development system for the Macintosh. Provides full access to all ROM routines and other Apple software like *MacinTalk* and *Three D Quickdraw.* Creates stand-alone double-clickable applications and desk accessories, and it's compatible with Apple's MDS. $99.95 + 5 s/h.
TML Systems, P.O. Box 361626, Melbourne, FL 32936, 305/242-1873

DeSmet C Compiler

Full K & R native code C compiler, 68000 assembler, object file linker and librarian, machine level debugger, editor (See™), RAM disk emulator. SANE (IEEE) floating-point support, program development shell, 120+ standard library routines, and 450+ ROM library interfaces. $150.
C Ware, 505 W. Olive #767, Sunnyvale, CA 94086, 408/720-9696

○ *Data Management*

DATAFAST

A powerful yet SUPER-EASY-to-use professional database management program. Create mailing lists, directories of customers, inventories, etc. Use predefined formats or create your own. Easy entering, sorting, and updating of data. "Copy" and "Paste" records into your *MacWrite* documents. $49. Req. 128K, 1dd.
Statsoft, 2832 E. 10th St. #4, Tulsa, OK 74104, 918/583-4149

○ *Educational*

Test Generation/Grade Book

MICROTEST II—Create, update, generate, & store exam materials. Easy question entry, large database, print multiple versions. *MICROGRADE*—Research-based, includes most-wanted features! Flexible course & grading structure, complete statistical pkg.; create variety of reports. Free brochures, demo pkgs. $5 each.
Chariot Software Group, 3659 India St. #MD-1, San Diego, CA 92103, 619/298-0202

Religious & Graphics Series

Scripture Bits (Bible calendar) $22*
MacConcord (N.T. concordance) $42.95
MacScripture (Old & N.T.) $140
Religious Art Portfolio $24.95*
Electro Bits (circuit graphics) $24.95*
Orlando a la Carte! (dining) $19.95*
MacMundo (newsletter disk in Spanish) $8
*English or Spanish
Medina Software, Inc., 2008 Las Palmas Circle, Orlando, FL 32822, 305/281-1557

○ *Engineering*

Digital Logic Design Aid

LogiWorks is an interactive digital logic drawing and simulation package for the Macintosh. Features:
- built-in library of common gates, flip-flops, etc.
- user-defined devices, PROMs and PLAs
- adjustable device delays

- 3-state and open-collector devices
- produces timing diagram of selected signals
- $159.95 (U.S.)
- 128K version (no user-defined devices) $79.95 (U.S.)

Capilano Computing, 548 Beatty St., Vancouver, B.C. V6B 2L3 Canada, 604/669-6343

BEAMAC II for CEs MEs

Analysis & design programs. Any # of nodes, elements, loads. Structure, load, tension, shear, moment & deflected shape diagrams, in & out text, section table, more. Full Mac interface. FRAME-MAC (2-D frames) $495; BEAMAC II (continuous beams) $295; BEAMAC (simple beams) $95. $-back guarantee. Free support.
Erez Anzel, 5800 Arlington Ave. #5T, Riverdale, NY 10471, 212/884-5798

Tolculator

Automates Geometric Tolerancing Design and Inspection. Positional fit & other formulas; picks drill, c'bore, etc.; math (trig., least squares, etc.); tolerance circuits; probability studies. Auto in process sampling & coordinate measuring mach. output analysis; metric conv., & much more. Req. *Microsoft Excel.* No computereeze. Not protected. $125.
Samuel J. Levy Engineering, 2943 Cortina Dr., San Jose, CA 95132, 408/251-7058

CAE Schematic Capture

Why pay more? *McNET* has it all! Full-function schematic capture package. Build component library, enter schematic, and generate NET LIST. User-friendly and fast. Best CAE software on Mac.
Argus Software, Musgrove Building, 2 Elm Square, Andover, MA 01810, 617/475-8952

○ *Fonts*

Indiawrite Fonts

Fonts for writing Hindi, Bengali, Tamil, Sinhala, Gujerati, Punjabi each $99; Sanskrit $149. Diacritic alone $29. Several fonts in several sizes, plus roman with diacritic with each. All conjuncts available. Tested by Paris University. Specify U.S. or U.K. keyboard. Checks only.
Indiawrite, 735 W. 183rd St. #2A, New York, NY 10033 or 24 rue Macarez, Valenciennes 59300 France

○ *Fonts*

Downloadable Laser Fonts

Specialized fonts for the LaserWriter. Classical Greek (SMK™ or WSU format) $85. Serif/sans-serif for scientific texts $75. Font of 100 chemical structures $125 (with scientific text fonts $160). Polish serif or sans-serif $85 each (4 styles). Soon: small caps and modern Greek. MC/Visa.
Allotype Typographics, 1600 Packard Rd. #5, Ann Arbor, MI 48104

○ *Games*

Dungeon Masters

Gamemaster #1 provides four utilities for the FRP game master. Save hours on repetitive tasks with NPC Generator, Experience Point & Attack Priority Calculators, and Multiple Random Roller. Requires MBASIC 2.0 or later. $25 includes s/h. Check or money order to:
Hack & Slash Software, 1525E S. Broadway, P.O. Box 6066, Santa Maria, CA 93456

MacGolf™

The ultimate graphic golf simulation game. So much like real golf you'll be amazed. Digitized golfing figure, real-life digitized sounds. Two unique 18-hole courses. View trees, sand traps, fairways, lakes, and flags in true perspective. Check wind speed, choose from 14 clubs, set your stance for hook or slice, and swing. Only $59.95 + s/h. 100% satisfaction guar. 512K req.
Practical Computer Applications, Inc., 1305 Jefferson Hwy., Champlin, MN 55316, 612/427-4789

Fame and Fortune

Tarot for the Mac—full Mac interface, graphics, and ease of use make this a great update of an ancient art. $35 includes shipping. Check or money order.
Hack & Slash Software, 1525E S. Broadway, P.O. Box 6066, Santa Maria, CA 93456

○ *Graphics*

Mac-Art Library

Mac-Art Library is 11 full disks of professional quality *MacPaint* art files. At $29.95/disk, choose from *Animals, Plants, Transportation, Sports, The Farm, Tools, The Kitchen, Buildings, Signs/Symbols, Greeting Card Art, Geography.* Or get all for $200. Also available: a Library Sampler for $39.95.
CompuCRAFT, P.O. Box 3155, Englewood, CO 80155, 303/850-7472

Magic Slate—Version 2.0

A dynamic graphics program that brings to the Mac environment an exciting art medium stimulating untapped artistic talent. Slate provides features typically found in expensive systems. Since you have a state-of-the-art computer, it makes sense to support it with similar software that opens the door to a fulfilling new personal experience.
Devionics, P.O. Box 2126, Covina, CA 91722, 714/779-7193

EZ-Draft™ CAD Software

Now you can have mainfraime CAD power at a fraction of the usual cost! *EZ-Draft* is a full-feature professional drafting system for the Macintosh™ Plus. Ideal for the casual user. Lets the expert outdraw any other PC drafting system available. Perfect for any kind of drawing. A surefire way to boost profits.
Bridgeport Machines, P.O. Box 32, Bridgeport, CT 06606, 800/242-2404

Sizer/Adjacency

MacDraw D/As add power: size any object by typing in dimensions, accurate to 0.0001. Force objects together on near sides. Cut & paste values for easy dimensioning. Send disk with *MacDraw* & 84K free space. $69.95 (MA $73.43). MC/Visa.
MFE Associates, P.O. Box 851, Amherst, MA 01002, 413/549-7626

○ *Languages*

NEON™

An object-oriented programming language, NEON™ offers a Smalltalk-like environment implemented as an efficient threaded language to provide new power, flexibility and speed for developing for the Mac—on the Mac. $195 + $5 s/h. Neon™ Assembler $50 + $5 s/h.
Kriya Systems, Inc., 6 Export Dr., Sterling, VA 22170 1-800-34-KRIYA or 703/430-8800

Multitasking for the Mac

Mach1™ is Forth-83 with:
- True multitasking
- Twice the speed of other FORTHS
- Hi-level access to Toolbox, floating-point, & speech routines
- A *standard* MC68000 assembler
- *Normal* text source files
- Turnkey applications
- $49.95 Visa/MC
- No licensing fees

The Palo Alto Shipping Company, P.O. Box 7430, Menlo Park, CA 94026, 415/854-7994, 800/443-6784

MacScheme™—A Mac LISP

A LISP environment that makes a 512K Mac feel like a LISP machine. MacScheme™ features a fast, reliable byte code interpreter with debugger, trace facility, and helpful error reporting. Its Smalltalk-like interface offers multiple windows and an editor that understands LISP syntax. $125.
Semantic Microsystems, 4470 S.W. Hall St. #340, Beaverton, OR 97005, 503/643-4539

Pascal Extender/C Extender

Compiled libraries of high-level routines let you quickly & easily create windows, menus, scroll bars, & dialogs & support many other features of Mac interface. Flexible & modifiable. 200-pg. manual & demos. MacPascal 2.0 or TML Pascal compiler versions $69.95. Megamax C or Aztec C version $129.95.
Invention Software Corporation, P.O. Box 3168, Ann Arbor, MI 48106, 313/996-8108

MacScheme™—A Mac Lisp

A LISP environment that makes a Mac feel like a LISP machine. MacScheme™ features a fast, reliable byte code interpreter, debugger, trace facility, and QuickDraw graphics. Its Smalltalk-like interface offers multiple windows and an editor that understands LISP syntax. Supports HFS, 512K or more RAM. $125.
Semantic Microsystems, 4470 S.W. Hall St. #340, Beaverton, OR 97005, 503/643-4539

○ *Marketing*

macINTERVIEW

macINTERVIEW is a variable market or opinion survey program to quickly analyze all kinds of inquiries. macINTERVIEW presents the results in tabular form as bar, column, or polarity charts on the screen or in print. macINTERVIEW enables the user to edit, enter, classify, concentrate, cross-tabulate, and compare data. Macintosh 512K. $950 for English version.
Erich Breitschwerdt + Partner, Paulsmueblenstr. 41,4000 Dusseldorf 13, West Germany

◯ *Medical*

Medical & Dental Mgmt.

Solo or multipractitioner office includes patient (responsible party) billing, recall, paper/electronic claims, aging, collection, SuperBill, labels, diagnostic history, *Word/MacWrite,* audit & productivity reports. 24-hr. support. 512 + hard disk or XL. Mac Office. Demo from $100. AMEX/MC/Visa. 2400+ dealers.
CMA Micro Computer, 55722 Santa Fe Trail, Yucca Valley, CA 92284, 619/365-9718

◯ *Music*

StudioMac Music Kit

No experience required! StudioMac™ comes complete with Casio CZ-101 keyboard synthesizer, MIDI adapter, and easy-to-use software. Play new creations or *MusicWorks* pieces through the synthesizer. Great family entertainment. Synthesizer Kit $595, MIDI Kit $214, software only $125.
Creative Solutions, Inc., 4701 Randolph Rd. #12, Rockville, MD 20852, 301/984-0262

◯ *Printer Drivers*

The Print-Link™

A printer driver program, complete with cable, allowing choice of dot matrix, daisy wheel, and ink jet printers for the Macintosh. Mfrs. supported are Epson, Okidata, Panasonic, Citizen, Olympia, Brother, Juki, Dynex, C. Itoh, Diablo, Siemens, and still adding. $84.95.
GDT Softworks Inc., P.O. Box 1865, Point Roberts, WA 98281-1865, 604/291-9121 or 800/663-MACC

◯ *Public Domain*

Mac Public Domain

Mac Public Domain Software–Hundreds available, $10 per disk. Choose from applications, *Multiplan* templates, games, art, utilities, backup programs, disk editors, music, templates for business, desk accessories. Carefully organized with documentation. Send $1 for a catalog.
Educomp, 2431 Oxford St., Cardiff, CA 92007, 619/942-3838

Public-Domain Disks $9

Have access to 1000 public-domain programs by mail! Members pay $9 per disk plus $1 postage & handling. Send $20 for 1-year subscription. Includes intro disk with ten neat programs, plus listing of all disks in library, plus quarterly newsletter describing latest public-domain software.
PD Mac, Dept. M, P.O. Box 5626, Sherman Oaks, CA 91423

◯ *Real Estate*

Property Management

Comprehensive program for managing residential and commercial properties. Many management reports including: operating statement, delinquent rent, lease expiration, and transaction register. Provides check writing, check reconciliation, posting late fees, recurring expenses–$395. Investment analysis–$245.
Yardi Systems, 3324 State St. Ste. O, Santa Barbara, CA 93105, 805/687-4245

Investment Analysis

From RealData, the leader in real estate software. Latest tax rules included in this powerful sensitivity analysis for income property. Ten-year pro forma of cash flows, financing, resale, tax consequences, IRR/FMRR, and more. Flexible and easy to use. Requires *Multiplan™, Jazz™,* or *Excel™*. $195.
RealData, Inc., 78 N. Main St., South Norwalk, CT 06854, 203/255-2732

Property Management

From RealData, the leader in real estate software. Manage up to 70 residential or commercial units. Receipts/disbursements ledgers, extensive property profile, receivables and billing, check-writing, financial statement, and many more features. Completely macro driven for easy use. Requires *Excel™*. $250.
RealData, Inc., 78 N. Main St., South Norwalk, CT 06854, 203/255-2732

More Real Estate Tools . . .

From RealData, the leader in real estate software. Products for investors, commercial and residential developers, syndicators, mortgage lenders, brokers, and closing attorneys. Programs for the Macintosh and the IBM PC available for immediate delivery. AMEX, Visa, MasterCard welcome.
RealData, Inc., 78 N. Main St., South Norwalk, CT 06854, 203/255-2732

◯ *Science*

Tools for Scientists

Two low-priced products that will enhance the usefulness of your Mac. Our *Scientific Symbols Fonts* disk contains all the characters in IBM's Selectric™ symbols ball and more for $20. The *Spectral Analysis* package provides four basic functions: forward and inverse transform, power spectrum, and autocorrelation. $65.
Renaissance Software Systems, P.O. Box 329, New York, NY 10028-0006, 212/794-2273

◯ *Speech Synthesis*

MacinTalk from MS-BASIC™

CLR SpeechLib allows you to produce high-quality speech from BASIC. English and phonemic input can be used. Speech rate, pitch, and volume can be easily controlled. BASIC 2.0 or 2.1 required. No additional hardware needed. $35 + $3 postage and handling. 24 hrs. 7 days. MC/Visa.
Clear Lake Research, 5353 Dora St. #7, Houston, TX 77005, 800/835-2246 ext. 199, 800/362-2421 ext. 199 in Kansas

◯ *Spec Writing*

MacSpec

A professional's word processor for writing specs, proposals, and technical papers. With automatic:
- Section numbering
- Indentation
- Table of contents
- New table of contents and numbers when paragraphs are changed
- All you worry about is input of text.

Compatible with existing word processors. $199.95.
LM Software, P.O. Box 93, Belmont, CA 94002, 415/594-0627

◯ *Security*

Advanced Copy Protection

The leading software manufacturers depend on Softguard copy protection. Introducing the *MACLOK Kit™*, a complete copy protection system that runs on the Macintosh.
- Stops all copybusters
- FULL HARD DISK support
- No source code changes
- Compatible with all Macintosh systems.

Free demo disk.
Softguard Systems, Inc., 2840 San Tomas Expwy. #201, Santa Clara, CA 95051, 408/970-9240

◯ *Spelling Checker*

Spellswell™

A better spelling fixer for *MacWrite™, Word™* and text documents.
- Catches mistakes the others don't, like "insufficient funs"
- Checks homophones, e.g., there/their
- Handles hyphens/abbreviations
- Maintains capitalization
- Add/remove words from dictionary
- Separate document dictionaries
- $49.95

Greene, Johnson, Inc., 15 Via Chualar, Monterey, CA 93940, 408/375-2828

◯ *Statistics*

Number Cruncher Stat Sys

Integrated, menu-driven, Mac statistical system including: Multiple and stepwise regression, t-tests, correlation, scatter plots, up to 4-way ANOVA, principal components, cross tabulation, transformation, nonparametrics and much more. Complete Mac interface. Transfer data to/from clipboard. $79. Requires 2dd.
NCSS-Mac, 865 E. 400 N., Kaysville, UT 84037, 801/546-0445

STATFAST

Professional but easy-to-use, SUPERFAST statistical package. Unlimited size of data files. Incl. two flexible data editors (can access *Multiplan* & other files), descriptive stats, t-tests, correlations, cross-tabulation, nonparametric stats, general multifactor ANOVA/ANCOVA, multiple regression, charts, plots, and more. $119. Req. 128K, 1dd.
Statsoft, 2832 E. Tenth St. #4, Tulsa, OK 74104, 918/583-4149

◯ *Tax*

Professional Tax Planner

Multiplan or *Excel* users, plan indiv. or corporate strategy, incl. current & prop. tax law changes, easy spreadsheet commands. Compute deprec. & ITC, compare side by side, project ten yr. +. Fully adjust. EZTax-PLAN PRO $295 + $3 s/h. Specify your spreadsheet & machine. MC/Visa. Individual pkg. also avail. Free info.
EZWare Corporation, Dept. 5, P.O. Box 620, Bala Cynwyd, PA 19004, 800/543-1040, 215/667-4064 in PA

TAX-PREP™

Multiplan or *Excel*–fast, easy preparation of 1985 tax returns for individuals or tax professionals. Easy spreadsheet commands. Make fast last-minute changes. IRS-approved printout. 22 sched. *Multiplan* or *Excel* req. Avail. Jan. Specify your spreadsheet & machine. Mac $99.95 + $3 s/h. PA add 6% tax. Visa/MC.
EZWare Corporation, Dept. 5, P.O. Box 620, Bala Cynwyd, PA 19004, 800/543-1040, 215/667-4064 in PA

Database Manager
Program stores tax receipt and other tax data in files created and formatted by the user. Files can be established for sales tax, interest income, medical bills, etc. New data is verified not already in file, then organized by date. One master file tracks deductions; a second tracks income. $18.
Gary Homes, 3906 Whooping Crane Circle, Virginia Beach, VA 23455, 804/464-1949

Mac Tax Software
Multiplan or *Excel*, extensive corporate tax planning, complete individual tax plan or prep. *Highly rated* individual or prof. use. Full customer support. Corp. tax planner $295. Individual tax planner $95. *Tax-Prep*™ individual tax prep. $99.95. Specify your spreadsheet, add $3 s/h or CALL NOW for free info. MC/Visa/Amex.
EZWare Corp., Dept. 5, P.O. Box 620, Bala Cynwyd, PA 19004, 800/543-1040 or 215/667-4064 in PA

○ *Utilities*

GRIDS™ Tools for MacPaint
Know where the window is! 2 disks of utility templates for MacPaint for producing professional-looking drawings and charts. A collection of various grids, scales, rulers, protractors and charts with instruction manual. Use it once and wonder how you did without it! $40 ppd. To order or request information:
Soft Wares Inc., 19 Monroe Dr., Williamsville, NY 14221, U.S. 800/848-5500, NY 800/447-5500, Ext. 50

MacBackup™
The quickest & easiest way to make exact duplicates of your original software. You'll never see "Insert your master," because this duplicate is your master. Loads many protected programs to hard drives. For 128K, 512K, 1 or 2 drives. You can prevent destruction to your original software for only $69.95 + shipping.
Practical Computer Applications, Inc., 1305 Jefferson Hwy., Champlin, MN 55316, 612/427-4789

The Macworld Directory is a comprehensive listing, by category, of products and services available for the Apple Macintosh. It provides advertisers with a low-cost advertising alternative and our readers with an easy reference guide.

FORMAT: The standard format includes a product ID, a 300-character descriptive ad, and a company name, address, and telephone number.

Advertisers may choose among categories already in use, or they may create their own. Display advertisers can cross-reference their current ad to the Macworld Directory for increased exposure.

RATES: Listings are accepted for a three-time consecutive insertion at a rate of $726. We offer a six-time insertion at $1230 that reflects a 15% frequency discount. Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, Visa, and MasterCard are accepted.

DEADLINE: For copy deadlines and further information please contact Niki Stranz, your Macworld Directory Account Manager, at 415/861-3861 or 800/872-7800 (800/872-7808 in California). Please send copy and prepayment to the Macworld Directory, 555 De Haro St., San Francisco, CA 94107.

Advertiser Index

Reader Service Number	
501	AST Research, 40
274	Affinity Microsystems, 64
306	Aldus Corp., 17
227	Altsys Corp., 165
370	Atari, 10-11
21	BASF, 28-29
481	BPI Systems, IBC
494	Beck-Tech, 135
486	Beck-Tech, 73
490	Bede Tech, 81
373	Best Computer Supplies, 58
38	Blyth Software, 26-27
381	Borland Int'l., IFC-1
479	Bridgeport Machines, 74
—	Business Computers of Peterborough, 181
—	Casady Co., 18
452	Cauzin Systems, 36-39
175	Central Point Software, 78
458	CompServCo, 56
496	CompuCover, 166
271	Computer Friends, 51
384	Cricket Software, 82
354	DataSpace Corp., 147
497	DataSpace Corp., 147
281	DataViz, 177
465	Disclone, 167
—	Disk World, 182
164	Diversions, 141
498	Dove Computer, 178
506	Environmental Software, 145
83	Ergotron, 148
—	GE Information Services, 85
323	GTCO Corp., 35
143	General Computer, 62
473	Great Plains Software, 151
257	Hayes, 14
434	Human Touch, 12
477	I/O Design, 145
272	Icon Review, 52-55
249	Infosphere, 83
484	Integrated Support, 184
—	International Apple Core, 153
171	Iomega, 8-9
11	Kensington, 42-44
246	Kriya Systems, 16
489	LM Software, 184
125	Layered, 127
493	Levco, 150
28	Linebacker, 144
455	Lyben Computer Systems, 160
295	MACohm Projects, 183
467	MDIdeas, 136
291	MPH Computer Products, 167
395	Mac Doctor Electronics, 141
4	MacConnection, 88-91
337	MacMemory, Inc., 24, 164
368	MacRentals, 154
16	MacStore, 183
503	MacVideo, 163
—	Macworld Expo, 170
2	Manhattan Graphics, 5
112	Manx, 49
261	MassTech, 73
267	Maxell, 7
505	MedQuest, 80
97	Mesa Graphics, 45
472	Micro-W Distributing, 160
—	Microsoft, 20-21, 22-23, 66
470	Microtech Peripherals, 48
406	Mirror Technologies, 57, 59
426	Model Office Co., The, 86
495	MultiVideo, Inc., 152
353	N² Products, 183
284	New Canaan Microcode, 164
215	Northeastern Software, 156-159
273	ODS, Inc., 134
13	Odesta, 46-47
436	Open Systems, 142-143
492	P³, Inc., 32
4	PC Connection, 88-91
45	PC Network, 168-169
387	Palantir Software, 68
450	Panamax, 183
504	Pecan Software Systems, 139
304	Peripherals Computers & Supplies, 180
223	Personal Computer Peripherals Corp., BC
480	Polarware/Penguin Software, 50
77	ProVUE Development Corp., 6
194	Programs Plus, 76-77
—	Rubicon Publishing, 15
—	Satori Software, 30
499	Shanner Int'l., 133
420	Singular Software, 61
247	Sof-Ware Tools, 166
435	Software Discoveries, 162
—	Software Library, 167
500	Software Ventures, 121
255	Sony, 113
367	Springboard Software, 70
225	StatSoft, 165
491	Systat, Inc., 84
177	Systems Control, 141
471	TML Systems, 146
478	Target Software, 60
167	Thunderware, 149
469	TrueBasic, 79
483	Tussey Computer Products, 75
134	USA-Flex, 138
383	Videx, 19
459	Vision Technologies, 167
439	Warp Nine Engineering, 155
374	Williams & Macias Microcomputer Products, 78

MACWORLD *The Macintosh™ Magazine*

Get more data on products you're interested in— simply return this card today. There's no cost. And no obligation.

It's easy to get more information on products advertised in Macworld. Here's how:

- Print or type your name and address in the spaces provided, and answer the questions that apply to you or your company. (These questions help us to better meet your needs and the needs of our advertisers.)
- Circle the number(s) on the card that corresponds to the reader service number(s) for the product(s) in which you're interested. For your convenience, the reader service number appears in the ad and in the Advertiser Index.
- Detach the card from the magazine, fold, seal with tape (please do not staple), apply first-class postage, and mail. Literature on the products you're interested in will be mailed to you directly from the manufacturer, free of charge.

Free Product Information Service

Please print or type all information.

Name

Company

Address

City, State, Zip (Zip code needed to insure delivery)

Phone: Area Code/Number

PLEASE NOTE: This card is for your convenience in obtaining information on products advertised in *Macworld*. Please send editorial comments or inquiries to: The Editor, *Macworld*, 555 De Haro St., San Francisco, CA 94107. Thank you.

Valid through 8/6/86

1. Your primary job function:

☐ (A) Corporate or general management
☐ (B) Department manager
☐ (C) MIS manager
☐ (D) Professional
☐ (E) Other _____

2. Number of employees in your company:

☐ (1) 25 or less
☐ (2) 26-99
☐ (3) 100-499
☐ (4) 500-999
☐ (5) 1000+

3. Information requested for:

☐ (A) Business applications
☐ (B) Home applications

4. Reason for inquiring:

☐ (1) Plan to buy—next 3 months
☐ (2) Plan to buy—4-6 months
☐ (3) Plan to buy—7-12 months
☐ (4) Plan to buy—beyond 12 months
☐ (5) Reference only

5. For how many personal computers do you buy products? (Include both company and personal units, please.)

☐ (A) 1
☐ (B) 2-4
☐ (C) 5-9
☐ (D) 10 or more

6. How many of the above are Macintoshes?

☐ (1) 1
☐ (2) 2-4
☐ (3) 5-9
☐ (4) 10 or more

7. How much do you plan to spend in the next 12 months for peripherals and other add-ons for the Macintosh(es)?

☐ Less than $250
☐ $250-$499
☐ $500-$999
☐ $1000 or more

8. How much do you plan to spend in the next 12 months on software for the Macintosh(es)?

☐ Less than $250
☐ $250-$499
☐ $500-$999
☐ $1000 or more

☐ Please bill me $30 for a 1-year (12-issue) subscription to *Macworld* (U.S. only). 4A3X6 W[I] May 86

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96

97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192

193	194	195	196	197	198	199	200	201	202	203	204
205	206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264
265	266	267	268	269	270	271	272	273	274	275	276
277	278	279	280	281	282	283	284	285	286	287	288

289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312
313	314	315	316	317	318	319	320	321	322	323	324
325	326	327	328	329	330	331	332	333	334	335	336
337	338	339	340	341	342	343	344	345	346	347	348
349	350	351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370	371	372
373	374	375	376	377	378	379	380	381	382	383	384

385	386	387	388	389	390	391	392	393	394	395	396
397	398	399	400	401	402	403	404	405	406	407	408
409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432
433	434	435	436	437	438	439	440	441	442	443	444
445	446	447	448	449	450	451	452	453	454	455	456
457	458	459	460	461	462	463	464	465	466	467	468
469	470	471	472	473	474	475	476	477	478	479	480

481	482	483	484	485	486	487	488	489	490	491	492
493	494	495	496	497	498	499	500	501	502	503	504
505	506	507	508	509	510	511	512	513	514	515	516
517	518	519	520	521	522	523	524	525	526	527	528
529	530	531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550	551	552
553	554	555	556	557	558	559	560	561	562	563	564
565	566	567	568	569	570	571	572	573	574	575	576

MACWORLD

Complete this card, fold, seal with tape (please do not staple), apply postage, and mail. Manufacturers will mail you literature directly, free of charge.

MACWORLD
Free Product Information Service

Just return the card–
to get more facts on the products that interest you!

PLACE
FIRST-CLASS
POSTAGE HERE.
(POST OFFICE
WILL NOT DELIVER
WITHOUT STAMP.)

Macworld
Product Information Service
P.O. Box 92844
Rochester, NY 14692

Product Index

Reader Service Number

Software

Business
274 Affinity Microsystems, 64
306 Aldus Corp., 17
486 Beck-Tech, 73
381 Borland Int'l., IFC-1
384 Cricket Software, 82
249 Infosphere, 83
125 Layered, 127
— Microsoft, 20-21
436 Open Systems, 142-143
— Satori Software, 30
247 Sof-Ware Tools, 166
225 StatSoft, 165
491 Systat, Inc., 84
383 Videx, 19

Communications
281 DataViz, 177
249 Infosphere, 83
97 Mesa Graphics, 45
387 Palantir Software, 68
304 Peripherals Computers & Supplies, 180
500 Software Ventures, 121

Data Management
38 Blyth Software, 26-27
381 Borland Int'l., IFC-1
125 Layered, 127
13 Odesta, 46-47
77 ProVUE Development Corp., 6
420 Singular Software, 61
435 Software Discoveries, 162
247 Sof-Ware Tools, 166
383 Videx, 19

Educational
486 Beck-Tech, 73
503 MacVideo, 163
367 Springboard Software, 70
225 StatSoft, 165

Entertainment/Strategy
486 Beck-Tech, 73
367 Springboard Software, 70

Financial
481 BPI Systems, IBC
473 Great Plains Software, 151
— Microsoft, 20-21
436 Open Systems, 142-143

Graphics
306 Aldus Corp., 17
227 Altsys Corp., 165
479 Bridgeport Machines, 74
— Casady Co., 18
458 CompServCo, 56
384 Cricket Software, 82
477 I/O Design, 145
125 Layered, 127
2 Manhattan Graphics, 5
97 Mesa Graphics, 45
480 Polarware/Penguin Software, 50
247 Sof-Ware Tools, 166
374 Williams & Macias Microcomputer Products, 78

Reader Service Number

Languages/Development Systems
246 Kriya Systems, 16
112 Manx, 49
— Microsoft, 66
504 Pecan Software Systems, 139
471 TML Systems, 146
469 TrueBasic, 79

Personal Business/Home
381 Borland Int'l., IFC-1
503 MacVideo, 163
492 P³, Inc., 32
— Rubicon Publishing, 15
374 Williams & Macias Microcomputer Products, 78

Word Processing/Spelling Checkers
489 LM Software, 184
— Microsoft, 22-23
478 Target Software, 60

Miscellaneous
306 Aldus Corp., 17
175 Central Pt. Software, 78
465 Disclone, 167
505 MedQuest, 80
472 Micro-W Distributing, 160
426 Model Office Co., The, 86
284 New Canaan MicroCode, 164
273 ODS, Inc., 134
— Satori Software, 30
374 Williams & Macias Microcomputer Products, 78

Hardware

Computers
370 Atari, 10-11

Digitizer
323 GTCO Corp., 35
167 Thunderware, 149

Hard Disks
501 AST Research, 40
143 General Computer, 62
171 Iomega, 8-9
493 Levco, 150
467 MDIdeas, 136
470 Microtech Peripherals, 48
406 Mirror Technologies, 57, 59
223 Personal Computer Peripherals, BC
439 Warp Nine Engineering, 155

Printers/Printer Accessories
271 Computer Friends, 51
354 DataSpace Corp., 147
497 DataSpace Corp., 147
164 Diversions, 141

Miscellaneous
494 Beck-Tech, 135
490 Bede Tech, 81
452 Cauzin Systems, 36-39
271 Computer Friends, 51
354 DataSpace Corp., 147
497 DataSpace Corp., 147
498 Dove Computer, 178
83 Ergotron, 148
257 Hayes, 14
434 Human Touch, 12
484 Integrated Support, 184
11 Kensington, 42-44
295 MACohm Projects, 183
395 Mac Doctor Electronics, 141
337 MacMemory, Inc., 24, 164
261 MassTech, 73
495 MultiVideo, Inc., 152

Reader Service Number

353 N² Products, 183
450 Panamax, 183
177 Systems Control, 141
383 Videx, 19

Accessories

Disks
21 BASF, 28-29
465 Disclone, 167
455 Lyben Computer Systems, 160
267 Maxell, 7
255 Sony, 113
134 USA-Flex, 138
459 Vision Technologies, 167

Miscellaneous
490 Bede Tech, 81
373 Best Computer Supplies, 58
496 CompuCover, 166
164 Diversions, 141
506 Environmental Software, 145
11 Kensington, 42-44
28 Linebacker, 144
291 MPH Computer Products, 167
499 Shanner International, 133
177 Systems Control, 141

Mail Order

58 Best Computer Supplies, 58
— Business Computers of Peterborough, 181
— Disk World, 182
272 Icon Review, 52-55
4 MacConnection, 88-91
16 MacStore, 183

Reader Service Number

215 Northeastern Software, 156-159
4 PC Connection, 88-91
45 PC Network, 168-169
194 Programs Plus, 76-77
— Software Library, 167
483 Tussey Computer Products, 75
459 Vision Technologies, 14

Organizations/ Services

— GE Information Services, 85
— International Apple Core, 153

Events

— Macworld Expo, 170

The Product Index is published as a service to our advertisers and may be discontinued at the publisher's discretion. Every reasonable effort is made to categorize advertisers correctly. If a listing should be changed, please write us at Macworld, *555 De Haro Street, San Francisco, CA 94107, so that we have the opportunity to change it.*

MacLink

...the "intelligent" link between your Macintosh and the IBM PC

MacLink allows you to translate spreadsheet and word-processing files between the Macintosh and the IBM PC . . . easily and quickly.

Now you can translate spreadsheets between Lotus on the PC and Multiplan on the Mac . . . including formulas, column formats, and functions.

And MacLink allows you to transfer any other type of file between the two machines as well . . . including binary, CSV, SYLK, text, WKS (Jazz/Excel), and Word files.

MacLink's integrated communications and unique translators

Unique PC ◆◆ Mac Translators!

And you can translate documents between Wordstar, Multimate or Displaywrite on the PC and MacWrite on the Mac . . . including margin settings, paragraphing, columns, and print styles.

work via modems or with an optional PC to Mac cable.

The cost is just $125: This includes the MacLink manual, and a MacLink disk for both the PC and the Mac. $155 with cable.

DataViz, Inc. – 16 Winfield Street – Norwalk, CT 06855
(203) 866-4944

Trademarks: IBM, Lotus, Macintosh, MacWrite, Multimate, Multiplan, Wordstar, Displaywrite, Excel, Jazz, Word

Circle 281 on reader service card

MACSNAP™

BLOW UP YOUR MACINTOSH WITHOUT GETTING BURNED

Get explosive growth in productivity with the new memory upgrade from DOVE Computer.

All you do is give your local computer dealer ten minutes to literally "snap" our RAM expansion board into your Macintosh.* No trace cutting. No soldering. In fact, you can even do it yourself with a MacSnap* User Kit, also available from your dealer.

Upgrade your 512K Mac to 1.0 or 2.0 full megabytes of RAM. Or take your 128K to 1.5 megs. For all the speed and productivity you'll ever need.

Using all the extra speed and capability is a snap, too. Because you get complete, easy-to-understand documentation and a quality upgrade designed to improve your productivity. MacSnap is fully compatible with all Macintosh system software, but it doesn't stop there. It comes with its own performance software package that includes Switcher* and a user-configurable RAMdisk.This allows you to fully utilize your expanded memory. With up to 60 percent more speed than a 512K Mac, MacSnap speeds up those normally cumbersome programs like EXCEL* and JAZZ* and even allows them to run simultaneously on a single disk drive. In addition, MacSnap's "print spooling" capability lets you print one document while working on another.

MacSnap is fully compatible with HyperDrive* and Apple's new 128K ROM, too!

So go ahead. Create elaborate spreadsheets. Increase the size of your documents. Construct complex graphics and page layouts. Manage up to eight applications at once. All at RAM speed.

For more information, call DOVE COMPUTER toll-free. Or ask your dealer to call.

1-800-MAC-SNAP

DOVE

COMPUTER CORPORATION
P.O. Box 7008
Wilmington, NC 28406

PC Productivity Enhancement Products

See us at COMDEX/Spring '86
Booth 4946–West Hall

*MacSnap™ is a registered trademark of Dove Computer Corporation. Macintosh is a trademark licensed to Apple Computer, Inc. Switcher is a registered trademark of Apple Computer, Inc. Excel is a registered trademark of Microsoft, Inc. Jazz is a registered trademark of Lotus Development Corp. HyperDrive is a trademark of General Computer Corp.

Circle 498 on reader service card

Open Window

Unlocking spreadsheets, finding files through BASIC, looking at PostScript, and other tips

Edited by Jim Heid

This month: the results of a test comparing Microsoft BASIC 2.1 with Addison-Wesley's True BASIC, information on Apple's revised Imagewriter system file, a way to unlock protected Multiplan *and* Excel *worksheets using* MacTools, *and a technique for creating PostScript files for transmission to a LaserWriter. If you like to program, read about a useful subroutine that searches installed floppy disks for a specific file. For Macintosh owners who also use Radio Shack's Model 100 portable computer, a printformatting program improves the Model 100's operation with the Imagewriter. Finally, some undocumented features of Apple's Font/DA Mover and Finder.*

Tried and True BASIC

Addison-Wesley recently released the Macintosh version of True BASIC, a version of BASIC created by John Kemeny and Thomas Kurtz, the Dartmouth professors who developed the first BASIC in 1964. I ran some benchmark programs on both True BASIC and Microsoft BASIC (MBASIC) and found that True BASIC is considerably faster.

My first test program was a prime number-generating program that measures a language's integer arithmetic and array-handling performance. True BASIC completed the program in 10.5 seconds, while both the decimal and binary versions of MBASIC 2.1 took 71 seconds. The second test was a simple FOR . . . NEXT loop that counted from 1 to 100,000. True BASIC completed the count in 20 seconds, versus MBASIC 2.1's 53 seconds.

True BASIC finished first primarily because it compiles a BASIC program into a compact intermediate code and then interprets that code when you run the program. MBASIC, by contrast, simply interprets the original code, a slower process.

Driving the Imagewriter

Many *Microsoft Word* users have expressed dissatisfaction with *Word*'s printing speed on the Imagewriter. The program seems to stop every few lines to access the disk and assemble more of the page; the program also hesitates before advancing to the bottom of a page when finished.

When Apple released Finder 4.1 along with the System Update application, I noticed that the Imagewriter driver's icon differed from the icon that appeared in *Word*'s System Folder. Substituting the new driver for the old increased *Word*'s printing speed significantly.

Michael G. Munro
Burke, Virginia

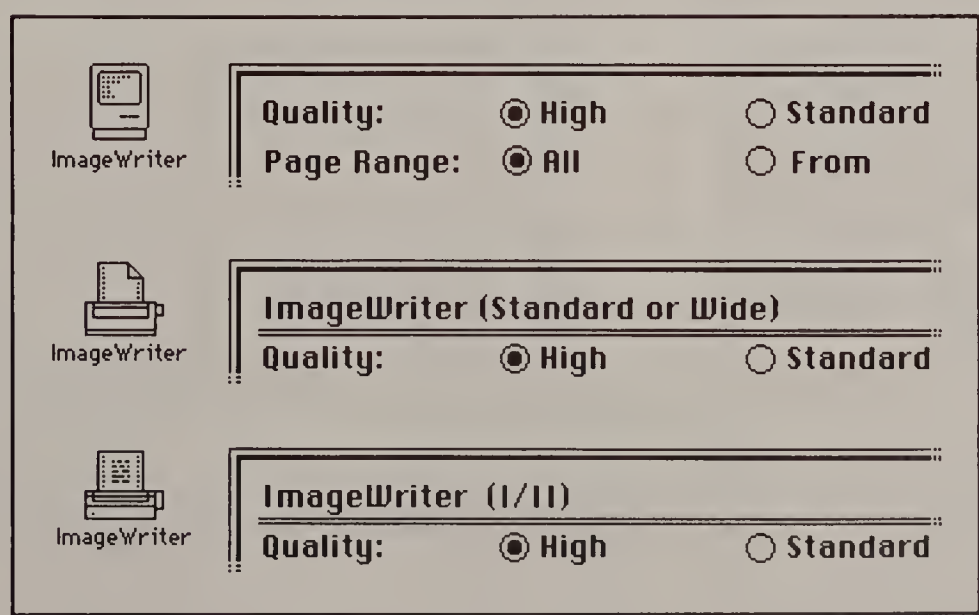
You're right. According to my stopwatch, Word *took 180 seconds to print a test page using the old Imagewriter driver, and 159 seconds using the new driver. The speed difference is greater when you print a page that's only partially full.*

The new driver is available free of charge from Apple dealers. To replace the old driver, simply copy the new driver to the Word *system disk and click OK when asked "Replace items with the same names with the selected items?" "Imagewriter Scorecard" shows how to tell one driver from another.—Ed.*

Picking the Spreadsheet's Lock

Recently, during the course of my work at an accounting firm, I encountered a situation in which a *Microsoft Multiplan* worksheet had been protected by a password, and the employee who created the file had quit without telling anyone the password.

(continues on page 184)



Imagewriter Scorecard
The early version of the Imagewriter driver uses the Mac system icon, while the version released with Finder 4.1 has its own Imagewriter icon. Version 2.0 of the latter version, which works with the ImageWriter II as well, displays an Imagewriter icon with text on the printout.

VersaTerm

Terminal Emulation and Communications Programs for the Macintosh™

The Professional VersaTerm Line of Software has a solution for your needs.

VersaTerm-PRO™ *New!*

The most Complete and Powerful Tektronix 4105 Macintosh Terminal Emulator on the market today!

Terminal Emulation
- Tektronix 4105
- DEC VT100
- Tektronix 4014
- Data General D200

File Transfer
- TEXT
- MacTerminal™ XModem
- Text XModem Protocol
- MacBinary XModem
- Text/Binary Kermit Protocol

Features
- Create TekPrint, MacDraw, MacPaint and MacWrite documents from memory.
- True interactive Zoom and Pan in memory with either the 4105 or 4014 graphics.
- Fully supports all text and graphics features of the Tektronix 4105.
- The 4105 dialog can either be a seperate window or text overlaying the graphics.
- Very high quality, full page graphics may be printed on either the ImageWriter or LaserWriter.
- Color output supported with ImageWriter II.
- Supports 4105 host and keyboard Macros.
- Copy either text or graphics to the Clipboard.
- Supports ALL Auto-Dial Modems.
- Supports the Hard Disk 20 with HFS.

Requires a 512K Mac, Mac-XL or Mac Plus, and optionally an ImageWriter(I/II) or LaserWriter printer and numeric keypad.

List Price $295

Special upgrade price for registered VersaTerm Owners.

VersaTerm™

"This solid program (VersaTerm) should be looked at by all power users, especially those with VT100 and Tektronix emulation needs."
— MacUser, Premiere Issue '85

Terminal Emulations
- DEC VT100
- Tektronix 4014
- Data General D200

File Transfer
- TEXT
- MacTerminal™ XModem
- Text XModem Protocol
- MacBinary XModem
- Text/Binary Kermit Protocol

Create TekPrint, MacPaint and MacWrite documents.

Graphics and Text terminal emulation and communications.
- Copy a text selection to the Clipboard.
- Up to 384 lines of text saved in memory.
- Supports ALL Auto-Dial Modems.
- Supports the Hard Disk 20 with HFS.
- Log text directly to a printer.
- Move the cursor within an editor using the mouse.
- Full screen Tek cross-hairs.
- Very High character throughput, up to 9600 baud.

Requires a 128K or 512K Mac, Mac-XL or Mac Plus.

List Price $ 99

TekPrint™

Requires a 128K or 512K Mac, Mac-XL or Mac Plus.

Zoom, Pan, Rotate and Print High Resolution Tektronix Graphics on the ImageWriter or LaserWriter Printer. Create MacDraw Documents. Use VersaTerm to preview and create TekPrint documents.

Registered VersaTerm Owners including a free VersaTerm update

List Price $ 79

VersaTerm Plus

Check our new VersaTerm-PRO!

VersaTerm Plus Package Including VersaTerm and TekPrint

List Price $175

VersaTerm-HP™

Requires a 128K or 512K Mac, Mac-XL or Mac Plus.

Same general features as standard VersaTerm, except the VT100 emulation is replaced with a Hewlett Packard 2621 emulation.

List Price $ 99

Published and Distributed by:

PERIPHERALS COMPUTERS & SUPPLIES INC.

Developed by:

Abelbeck Software

PCS Inc.
2457 Perkiomen Avenue
Mt. Penn, PA 19606
(215) 779-0522

Circle 304 on reader service card

(continued from page 179)

After some experimentation, I discovered that there is a flag in a spreadsheet file that indicates password protection. You can change this flag and remove the protection using a disk editor such as *MacTools*. The same indicator flag is present in *Microsoft Excel* files, though its location is different.

- Start *MacTools* and insert the disk containing the protected worksheet.
- Highlight the protected file and choose ViewEdit from the File menu.
- Use the horizontal scroll bar to locate the sector containing the protection flag. In *Multiplan* the flag is in block 3, part A, position 0079; in *Excel* it's in block 1, part B, position 0175 (see "Waiving the Flag"). The indicator 00 denotes no password protection, while 01 indicates protection. To remove the protection, select the 1 in the flag with the cursor and type 0.
- Check your work to make sure you altered the correct byte, then choose Write Block from the Misc menu.

Randal B. McDonald, Jr.
New York, New York

Inside PostScript

If you have a LaserWriter-equipped System file, you can see the PostScript statements that describe what you print. First, open the application and create a document or a drawing. Using the Choose Printer desk accessory, select the LaserWriter as the current printer, and then choose Print. Immediately after clicking OK in the print dialog box, hold down the ⌘ and F keys. Instead of the usual "Looking for LaserWriter" message, the line "Creating PostScript File"

(continues on page 182)

Excel File

```
Blck: 1 Part B

0100: 8F8F 7E2C C826 7E10 7E69 8F3D AD3D 7E6F    /.~,.&~.~i.=.=~o
0110: 8F16 857E 7F0D 7A6E 9000 6813 0E60 9000    ...~..zn..h..`..
0120: 0E14 850E 0D7A 6E7F 7E72 670D 7E0B 7E78    .....zn.~rg.~.~x
0130: 7964 0D00 0003 3ADC 4700 0000 128E 0008    yd....:.G.......
0140: 522A 0001 0008 0008 0D00 0004 C34E 7004    R*...........Np.
0150: 0000 0326 0000 0064 0001 0001 0001 0000    ...&...d........
0160: 3F50 624D D2F1 A9FC 0000 0100 00FF 0000    ?PbM............
0170: 0000 0000 0001 0001 0001 0001 FFFF 0000    ................
0180: 7869 0002 0000 000E FFFF FFFF FFFF 0000    xi..............
0190: FFFF 0000 0000 0001 004B 004B 004B 006E    .........K.K.K.n
01A0: 004B 004B 004B 004B 004B 004B 004B 004B    .K.K.K.K.K.K.K.K
01B0: 004B 004B 004B 004B 004B 004B 004B 004B    .K.K.K.K.K.K.K.K
01C0: 004B 004B 004B 004B 004B 004B 004B 004B    .K.K.K.K.K.K.K.K
01D0: 004B 004B 004B 004B 004B 004B 004B 004B    .K.K.K.K.K.K.K.K
01E0: 004B 004B 004B 004B 004B 004B 004B 004B    .K.K.K.K.K.K.K.K
01F0: 004B 004B 004B 004B 004B 004B 004B 004B    .K.K.K.K.K.K.K.K
```

Multiplan File

```
Blck: 3 Part A

0000: 8004 02C0 0000 6FAA 0002 8004 3230 0000    ......o.....20..
0010: 6FBE 03CD 0000 0000 0001 FFFF 0004 0009    o...............
0020: 01B1 0000 6EC8 00FA 0000 0006 0001 0000    ....n...........
0030: 0004 0000 BBCA 0000 BBCA 0009 023F 0000    .............?..
0040: 6FDC 0000 BBDA 0001 6FF8 0000 7C44 0028    o.......o...|D.(
0050: 0002 0029 0009 02E9 0000 000B 0698 0000    ...)............
0060: 6EF0 246A 0009 0001 0138 0196 002C 8004    n.$j.....8...,..
0070: 0028 0002 0035 0000 0001 0000 0000 0001    .(...5..........
0080: 0000 0002 0001 0000 0058 0060 0648 0648    .........X.`.H.H
0090: 0648 1822 1E6A 2002 2032 0060 00E0 0107    .H."..j . 2.`....
00A0: 01F1 0000 0002 000E 0007 0018 FFA0 0094    ................
00B0: 0060 0000 0107 00DC 0000 0000 000E 0002    .`..............
00C0: FFE4 FFA0 8800 0000 00E0 005C 01F1 0000    ...........\....
00D0: 0002 0007 0007 0018 FFF4 4400 0000 0000    ..........D.....
00E0: 005C 00DC 0000 0000 0007 0002 FFE4 FFF4    .\..............
00F0: C000 8482 0700 8042 0400 0002 0000 17E0    .......B........
```

Waiving the Flag

You can remove the protection from an Excel *or* Multiplan *worksheet with a disk editor such as* MacTools. *In* Excel *(top), the protection flag is located in block 1, part B, position 0175; in* Multiplan *(bottom), it's in block 3, part A, position 0079. To avoid damaging a worksheet by altering the wrong bytes, modify a copy of the original.*

"We will match any mail order price in this issue."

William F. Gollan
President, BCP

We won't charge you for shipping or handling, nor will we penalize you for using a credit card. We'll support, service and warranty everything we sell and stand behind it 100%.

PERIPHERALS

Apple*	
All Products + Laserwriter & Hard Disk	CALL
Assimilation	
All Products	CALL
Curtis	
Diamond	32.95
Emerald	38.95
Ruby	53.95
DC Hayes	
Smartmodem 1200	379.95
Smartmodem 2400	589.95
Disks	
BASF (5)	13.95
Maxell (10)	24.95
Memorex (10)	27.95
Fuji SS/DD	27.95
Fuji DS/DD	37.95
Verbatim (10)	27.95
Ergotron	
Mac Tilt	79.95
MacBuffer w/256k	209.95
Iomega Bernoulli	
Bernoulli 10	1729.95
Bernoulli 10 + 10	2309.95
Bernoulli 20 + 20	CALL
Joysticks	
Kraft Quick Stk.	49.95
Video 7 Mouse Stk.	44.95
Kensington	
A-B Box w/Cable	63.95
Control Cnt.	64.95
Dust Mac	9.95
Dust Image 10"	9.95
Surge	34.95
Swivel	24.95
Starter Pac	56.95
Printer Stand	19.95
Mouse Cleaner w/Pck.	19.95
Head Cleaner	22.95
Polarizing Flt.	34.95
Mirror	
400 kB Drive	174.95
800 kB Drive	309.95
Okidata	
192 Image	379.95
193 Image	554.95
Paradise	
Mac 10 Hard Disk	759.95
Mac 20 Hard Disk	1009.95
Prometheus	
Pro 1200 w/SW	339.95
Thunderware	
Thunderscan V2.0	179.95

BUSINESS SOFTWARE

Advanced Logic	
Mighty Mac	39.95
Spellworks	34.95
Aegis	
Mac Mail Telecom	34.95
Zap/Invoice	64.95
House Keeper	40.95
Affinity	
Tempo	69.95
Apple*	
All Products	CALL
Arrays	
Home Accountant	54.95
Brain Power	
Statview	103.95
Power Math	55.95
Compuserve	
Starter Kit	19.95
Creighton	
Mac Office	32.95
Mac Home	32.95
Mac Spell +	58.95
Data Logica	
dMac III	CALL
Dow Jones	
Straight Talk	48.95
Market Mng. +	113.95
Spreadsh. Link	61.95
Quick Set V2	32.95
Quick Word	37.95
Forethought	
Factfinder	89.95
Filemaker	112.95
Future Design	
Strickly Bus G/L	244.95
Hayden	
Know it's There	38.95
Speller +	48.95
Human Edge	
Mind Probe	32.95
Living Videotext	
Think Tank 512	129.95
Lotus	
JAZZ	Call
Microsoft	
Chart	76.95
File	115.95
Multiplan	115.95
Word	115.95
Excel	229.95
Helix 512	219.95

BUSINESS SOFTWARE

Monogram	
Dollars & Cents	84.95
Forecast	43.95
Open Systems	
Accounting Pkgs.	CALL
Organizational	
Omnis 3	278.95
Paladin	
Crunch 512	168.95
Peachtree	
AR/GL/AP (Ea.)	92.95
ProVue	
OverVue V 2.0	153.95
Satori	
Bulk Mailer	82.95
Legal Billing	CALL
Sierra On Line	
Mac One Write	139.95
Softsync	
Personal Acct.	59.95
Software Publishing	
PFS:File/Report	104.95
Softstyle	
Decision Map	84.95
Telos	
Business Filevision	219.95

UTILITIES & LANGUAGES

Batteries	
Battery Pak	31.95
Borland	
Sidekick	48.95
Central Point	
Copy II Mac	24.95
Microsoft	
Basic	89.95
Logo	79.95
Fortran	179.95
Nevins	
Turbo Charger 512	59.95

GRAPHICS & PUBLISHING

Enterset	
Quick Paint	32.95
Hayden	
Art Grabber w/Body	32.95
DaVinci Bldg. Blks.	50.95
DaVinci Comm. Int.	119.95
DaVinci Houses	32.95
DaVinci Int.	32.95
DaVinci Landsc.	32.95
Video Works	62.95
Home Design	49.95
IDDS	
Mac Draft	159.95
Magnum	
McPic V. 1	32.95
McPic V. 2	32.95
Slide Show	37.95
Manhattan	
Ready Set Go V 2.1	109.95
Miles	
Mac Knife V. 1	23.95
Mac Knife V. 2	28.95
Mac the Knife V.3	32.95
Silicon Beach	
Accessory Pak # 1	27.95
Silicon Press	51.95
Simon & Schuster	
Great Paper Air.	28.95
Mac Art Dept	28.95
Springboard	
Art a'la Mac #1	27.95
Art a'la Mac #2	27.95
T/Maker	
Click Art	32.95
Click Art Pub.	32.95
Click Art Let.	32.95
Click Art Eff.	32.95
ClickOn Wks.	49.95

EDUCATIONAL & PERSONAL

Brain Power	
Chipwits	30.95
Thinkfast	26.95
First Byte	
Smooth Talker	59.95
Kidtalk	44.95
Speller Bee	44.95
Davidson Assoc.	
Speed Reader II	40.95
Spell It	31.95
Math Blaster	31.95
Word Attack	31.95
Electronic Arts	
Pinball Const. Set	31.95
Dlx. Music Const. Set	36.95
Financial Cookbook	36.95
Forethought	
Typing Intrigue	33.95
Great Wave	
Concertware +	43.95
Haleys Comet	23.95
Concertware + Key	134.95
Concertware + Midi	69.95
Concertware + V1,V2,V2(ea)	9.95
Hayden	
Musicworks	48.95
Turbo Turtle	38.95
SAT Combo	61.95
Word Challenge	27.95
Palantir	
Mactype	31.95
Math Flash	31.95
Word Play	31.95
Scarborough	
Make Millions	32.95
Mastertype	30.95
Run for the $	32.95
Simon & Schuster	
Typing Tutor III	38.95
Think Educational	
Mind Ov. Mac	32.95
Mac Edge	32.95
Timeworks	
Evelyn Wood	45.95

GAME SOFTWARE

Activision	
Champ. Baseball	25.95
Hacker	32.95
Mind Shadow	32.95
Borrowed Time	32.95
Aegis	
Pyramid of Peril	27.95
Mac Challenge	27.95
Blue Chip	
Barron	33.95
Millionaire	33.95
Squire	33.95
Tycoon	33.95
Broderbund	
Ancient Art War	33.95
Cyborg	28.95
Lode Runner	28.95
Mac Command	23.95
Electronic Arts	
DJ & Larry Bird	30.95
Skylox	30.95
Golden Oldies	29.95
Epyx	
Rogue	28.95
Temple Apshai	28.95
Winter Games	28.95
Hayden	
Masterpieces	28.95
Sargon III	33.95
Perplex	28.95
Infocom	
Wishbringer	27.95
Cutthroats	27.95
Deadline	33.95
Enchanter	27.95
Hitchhiker's G.	27.95
Infidel	29.95

GAME SOFTWARE

Mind F. Voyaging	29.95
Planetfall	27.95
Seastalker	27.95
Sorcerer	29.95
Starcross	29.95
Suspect	29.95
Suspended	29.95
Witness	27.95
Zork I	27.95
Zork II, III (ea)	29.95
Mark of Unicon	
Mouse Stampede	26.95
Microsoft	
Entrepreneur	34.95
Flight Simulator	CALL
Miles Computing	
Strike Mission	32.95
Fusillade	28.95
Mac Wars	31.95
Overloads	31.95
Mindscape	
Balance of Power	33.95
De Javu	38.95
Racter	31.95
Stephen King's Mist	28.95
James Bond View K	28.95
Perfect Score SAT	52.95
Origin Systems	
Exodus Ultima III	42.95
PBI Software	
Feathers & Space	25.95
Fokker Triplane	39.95
Strategic Conquest	33.95
Penguin	
Pensale	28.95
The Quest	28.95
Transylvania	28.95
Xyphus	28.95
Crimson Crown	28.95
Pryority	
Forbidden Quest	31.95
Gateway	31.95
Sierra On Line	
Champ Boxing	28.95
Frogger	28.95
Ultima II	38.95
Silicon Beach	
Airborne	25.95
Enchanted Scepters	25.95
Sir Tech	
Wizardry I	39.95
Spectrum	
Gato	31.95
Tellstar Lev. 1	31.95
Orbiter	31.95
Spinnaker/Telarium	
Amazon	32.95
Dragon World	32.95
Farenheit 451	32.95
Videx	
Mac Checkers	33.95
Mac Gammon	33.95

MONTHLY SPECIAL

PRINTER RIBBON 6 Pack Special

	Retail	BCP
• Imagewriter	49.95	24.95
• Epson LX80	74.95	34.95
• Epson FX80/85	49.95	24.95
• Epson FX100/185	74.95	34.95
• Okidata 192 Mac	79.95	39.95
• Okidata 92 Mac	29.95	15.95
• Imagewriter Color Pac (Br, Pur, Bl, Gr, Rd, Yl)	59.95	29.95

+ 2.50 Shipping

Terms & Conditions:

- Payment: MC/VISA, Certified and Bank Checks processed same day. Personal & Co. checks 21 day clearing.
- Purchase Orders: FOB NH, plus handling.
- APO/FPO: FOB NH, plus 3% handling (min $5.00) Alaska/Hawaii
- International: FOB NH, plus 15% handling (min. $15.00)
- Credit Card Security: MC/VISA orders which are to be shipped or billed to an address other than the card holders will be charged a $5.00 security center verification fee.
- Returns: All returns must have a valid RMA # Contact customer service for assistance. Defective software will be replaced with precisely the same product. Defective hardware will be replaced or repaired. If a customer has ordered the incorrect product it may be returned, software will be charged $8.50 S&H ad hardware $16.50
- Compatibility: BCP does not guarantee machine compatibility
- Matches: BCP must list the product with a price. Products with call do not apply
- Misc: Prices and availability subject to change

CUSTOMER SERVICE
(603) 924-9406

BUSINESS COMPUTERS
OF PETERBOROUGH
Golden Circle

P.O. Box 389
Peterborough, NH 03458

ORDERS ONLY 1-800-845-3003

SONY 3.5″DISKETTES AT THE LOWEST POSSIBLE PRICES!

Don't take chances with your Mac.

Use the diskettes it was designed around: genuine SONY 3.5″diskettes.

LIFETIME WARRANTY! AND LOWER PRICES THAN EVER...

SONY BY THE BOX: 3.5″SSDD

	Qty. 20 - 40:	Qty 50+:
Boxed in 10's	$ 1.85 ea	$ 1.81 ea.

SONY IN BULK:
(3.5″SSDD in boxes of 50.)
Boxed in 50's $ 1.61 ea.

THE FREEBIE!

Everybody seems to be giving something away to sell SONY diskettes, so we'll jump in as well.

Order 50 or more SONY 3.5″ diskettes and we'll include FREE, a plastic storage case that holds 36 of the little critters.

TO ORDER:

Ordering is simple: just call us TOLL-FREE at **1-800-621-6827.** (In Illinois, call **1-312-256-7140.)**

We accept VISA, MASTERCARD and C.O.D. orders. Corporations rated 3A2, governmental and quasi-governmental agencies may order on open account.

DISK WORLD, Inc. 629 Greenbay Road Wilmette IL 60091

(continued from page 180)

is displayed. This key sequence creates a file called PostScript that you can examine with *MacWrite* or *Word.*

Jeff Koch
Maple Valley, Washington

This technique could be useful for transmitting PostScript data to a typesetter over a modem or to minimize rental charges at a LaserWriter-equipped copy shop.—Ed.

Finding Files in MBASIC

I recently wrote an MBASIC 2.1 program that accessed numerous files. Unfortunately, unless all the files were on the default drive, the program would crash with a "File not found" error. Rather than coding the volume names directly into the program (as in OPEN "MyDisk:MyFile"), I wrote a subroutine that uses the PEEK function to obtain disk names directly from memory (see "Volume Search Listing"). The subroutine searches disks in the internal and external drives for the specified file. The disk containing MBASIC must be in the internal drive.

Robert Hall
Seattle, Washington

Printing in MacPaint

I wanted to print several copies of a *MacPaint* party invitation, but I realized that the program doesn't display the usual print dialog box where you specify the number of copies. I came up with a simple solution to avoid repeating the Print command for each copy I wanted to print: save the document on a disk with plenty of free space and use the Finder's Duplicate command to make as many copies of the document as you want to print. Select all the copies and choose Print from the Finder's File menu. Each copy will be printed in turn.

Rob McDaniel
Belleville, Illinois

Model 100 and the Imagewriter

Gordon Haig's tip on making a cable to connect Radio Shack's Model 100 to the Imagewriter was a big help (see "More on the Model 100," *Open Window,* December 1985). My cable works fine, but the alignment of text on the page is terrible. There's no left margin, and the Imagewriter prints text across the perforations at the bottom of each page.

(continues on page 184)

```
REM * * * Program to search disk volumes for file.
REM * * * Written by Robert J. Hall in Microsoft Basic 2.1(b), 12/1/85
 ON ERROR GOTO ErrorFix
 VolumeName$="":'                          {Assume default drive volume
 INPUT "What file do you want to locate";FileName$
' {Set pointer to default volume memory location before each file operation
 DefPtr=&H352
REM  * * Replace the line below with your OPEN or CHAIN statement
 FILES VolumeName$+FileName$:'             {Can use OPEN/CHAIN here instead
STOP:END

ErrorFix:
 IF ERR=53 THEN GOSUB Volume:'             {Type 53 File not found error
 RESUME

Volume:
 VolPtr=2^24*PEEK(DefPtr)+2^16*PEEK(DefPtr+1)
 VolPtr=VolPtr+2 ^8*PEEK(DefPtr+2)+PEEK(DefPtr+3)
' {Now have the address of volume pointer. If no volume found, show error.
 VolumeName$=""
 IF VolPtr=0 THEN ERROR 53:'               {Out of volumes: File not Found
 VNLength=PEEK(VolPtr+44):'                {Get length of volume name
 FOR I%=1 TO VNLength
  VolumeName$=VolumeName$+CHR$(PEEK(VolPtr+44+I%))
 NEXT I%
 VolumeName$=VolumeName$+":"
 DefPtr=VolPtr:'                           {Set pointer for next volume
RETURN
```

Volume Search Listing

This MBASIC subroutine uses the PEEK function to obtain disk names directly from memory, eliminating the need to code disk names directly into a program. For the subroutine to work properly, the MBASIC disk must be in the internal drive.

We RENT Mac Software !!

MacStore™

28 Tealwood
New Braunfels
Texas 78130

National **1-800-847-0026**

Ask about our frequent renter program !

We'll match any software rental price in this issue.

We have hundreds of other titles available for the Mac. If you don't see what you want - call us !

Accessory Pak 1	8.90
Art Grabber	8.90
Back to Basics G L, A P, or A R (each)	26.66
Battery Pak	8.90
Bulk Mailer	21.60
Business Filevision	56.25
Click Art, Effects, Letters, Publications (each)	8.90
Click-on Worksheet	13.33
Consultant	30.80
Copy II Mac	8.90
Championship Boxing or Baseball	8.90
Davinci (We have them all!)	Call
Dollars and Sense	21.50
Excel	57.75
Factfinder	22.95
Filemaker	32.44
Filevision & Business Filevision	Call
Fluent Fonts, Fontastic, Font Explorer,	Call
Laser Fonts, Superfonts, UltraFonts...	Call
Forecast	11.68
Gato, or Orbitor	8.90
Gridwars	8.90
Helix	57.80
Infocom games	Call
Jazz	89.90
Keystroke	64.68
Languages (Asm, Basic, C, Cobol,	Call
Experlisp, Fortran, Pascal)	Call
Microsoft Chart, File, Multiplan, Word	Call
Mac Attack	8.90
Mac Cad	Call
Mac Challenger or Mac Command	8.90
Mac Draft	37.85
Mac Draw	32.47
Mac Golf	Call
Mac Labeler	8.90
Mac Muscle	8.90
Mac Project	26.29
Mac Publisher & Mac Publisher II	Call
Mac Spell Right or Mac Spell +	14.95
Mac Stronomy	13.20
Mac Terminal	26.14
Mac 3 D	31.95
Mac Tracks	8.90
Mac the Knife 1, 2, or 3 (Art, Fonts, Ripper)	Call
Management Edge	35.65
MegaFiler, MegaForm, MegaMerge	Call
Mind Prober	8.90
Musicworks	13.19
My Office & My Office 512	Call
Omnis III	70.95
Overview	38.28
Pagemaker	99.90
Pinball Construction Set	8.90
Professional Composer	76.45
Quick Disk, Quick Word, Quick Paint (each)	8.90
Ready Set Go	19.90
Smooth Talker	15.36
Tempo	16.33
Think Tank 128 & 512	Call
TurboCharger	15.91
Video Works	16.63
Will Writer	Call
Accessories	
Sony Disks (10)	18.95
800k External Drives (double sided)	299.00
512 & 1 Meg Upgrade	Call
Mac Bottom 20 Meg Hard Disk	1119.00

No membership fee • 16 day rentals • Rental applies to purchase

The store logo is a trademark of MacStore, Inc., the apple logo is a trademark of Apple Computer, Inc.

MasterCard In Texas **1-800-222-1537** After tone ask operator for extension **993265** VISA

or dial direct **512-629-5419**

Circle 16 on reader service card

The right connection for the Mac Plus

Now you can connect your Mac Plus or Macintosh™ to a printer (including ImageWriter™ II), modem (including Apple® Personal Modem) or disk drive at an affordable price. Our Apple equivalent custom *molded* cables match the host computer in style and color and include thumbscrews.

Similar cables are also available for the Apple IIe, IIc and IBM® PC.

N² Products also manufactures custom cables for OEM applications.

Mac Plus Cables	Retail Price
Imagewriter II	$27.95
Apple Personal Modem	$27.95
SCSI Disk Drive	$32.95
Mac Plus to Macintosh Adaptor*	$19.95

Macintosh Cables	
Imagewriter II	$27.95
Apple Personal Modem	$27.95
Serial Printer	$29.95
Modem	$29.95

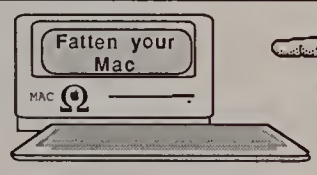
*Permits Mac Plus, modem, and printer ports to mate with standard Macintosh (DB-9) cable.

All items are available from stock.

Distributor and Dealer inquiries invited

N² PRODUCTS, INC.
2401 Qume Drive.
San Jose, CA 95131
408 435-0227
619 243-3632

Circle 353 on reader service card



512K Upgrades

- **3 Year Limited Warranty** (Extended Warranties Available)
- **No Soldering of RAMs**
- **Fast Service** (Overnight if desired)

We do not solder or desolder any of your RAM chips when we do your 512K upgrade. Because your board is not heated 512 times we can offer the best warranty available. Our upgrade uses an integrated circuit board that is soldered into seven empty holes in Mac's logic board. This means that there are no jumper wires exposed and that only a single trace needs to be cut. The RAMs are attached by use of a special socket that connects to the existing pins. 1.5MB upgrades are also available.

How to Place Your Order

We accept Master/Card, Visa, American Express, COD and Purchase orders from established accounts. All shipping is done by UPS Second Day Air. No extra shipping charge for foreign customers.

Call for more information:
(800) 851-2753
In IL (309) 833-1157 collect

MACohm Projects
129 N. Randolph
MAComb, IL 61455

512K Kit

No desoldering or soldering of RAMS!

If you enjoy the satisfaction of doing things yourself, then our Upgrade kit might be just what you are looking for.

What You Get

Our kit comes with 256K DRAMS,special sockets, integrated circuit board, Guided Tour Video Tape, a MacOpener Tool Kit, Soldering-Desoldering Tools, instructions, and our support for completing your UPgrade.

Comments

It was not necessary to desolder 256 chip pins, clean them, and resolder in sockets. You have a great idea in your upgrade kit. Edward Croop

The MACohm update is the best documented and supported product I have ever purchased. It is nice to know that good companies are beginning to emerge in the computer after-market. Thanks again and I'll be back. Robert L. Harris

Instructions were excellent– as good as I've ever read. Jim Ackil

Much better than I had expected (and I expected it to be very good). Mark Cochran

Light years ahead of any other upgrades for the VIDEO, book, materials, and tools. Martin Wixted

Directions were specific. Your video prepared me well—practice made it easy. S. Hindes

Circle 295 on reader service card

Go for the MAX™

SuperMAX™. The MAXimum in Surge Suppression, Noise Filtration, Under Voltage detection and protection, PLUS Telecommunication Line protection.

- Quality Power Line AND Data Line Protection
- Exceeds I EEE 587
- Status Lights
- Reset Switch
- Five Year Warranty
- Made in U.S.A.

PANAMAX
Toll Free 1-800-472-5555
In California 1-800-4-P-A-N-A-M-A-X
(1-800-472-6262)
150 Mitchell Boulevard, San Rafael, CA 94903

Circle 450 on reader service card

MacSpec™

MacSpec Developed for professionals who write structured documents. The first program designed to quickly organize and edit specifications, proposals and technical papers.

MacSpec The powerful word processor that:

- Automatically numbers & indents sections
- Sections re-number as they are moved
- Builds table of contents
- Sections collapse/expand

MacSpec - $199.95

LM Software™
P.O. Box 93
Belmont, CA 94002
(415) 594 - 0627

Circle 489 on reader service card

The Port Authority

RAM/Bus™

Integrated Support, Inc. is proud to introduce RAM/BUS™, the new, revolutionary Macintosh™ multi-function board. This new Macintosh™ upgrade includes 1.5 additional megabytes of memory, an external port, plus a SCSI port. Combined, these three advantages allow for unlimited expansion capabilities! To experience this exciting new upgrade first-hand, call 913/541-9590.

Integrated Support, Inc.,
8855 Long, Lenexa, Kansas 66215

Macintosh is a registered trademark of Apple Computer, Inc

Circle 484 on reader service card

```
10 OPEN "COM:88N1E" FOR OUTPUT AS 1
20 PRINT #1, CHR$(27); CHR$(76); "008";
30 PRINT #1, CHR$(29); CHR$(65); CHR$(64);
40 FOR T = 1 TO 50
50 PRINT #1, CHR$(64); CHR$(64);
60 NEXT T
70 PRINT #1, CHR$(67); CHR$(64);
80 FOR T = 1 TO 14
90 PRINT #1, CHR$(64); CHR$(64);
100 NEXT T
110 PRINT #1, CHR$(65); CHR$(64); CHR$(30);
120 CLOSE #1
```

Model 100 Printing
For improved formatting when printing with Radio Shack's Model 100 and the Imagewriter, type this program into the Model 100 and run it before printing. The program sets up the Imagewriter to provide an 8-character left margin and print 52 lines per page.

(continued from page 182)

The program in "Model 100 Printing" solves these problems by sending commands to the Imagewriter to control margins and pagination. Type the program into the Model 100 and save it. Follow these steps when you want to print files on the Imagewriter.

- Connect the Model 100 to the Imagewriter. Turn the Imagewriter on and advance the paper past the top rollers about ¾ inch.
- Run the BASIC program.
- Download the text files to be printed using the Model 100's Telcom program (follow the instructions in the December 1985 *Open Window*).

With my program, the Imagewriter provides an 8-character left margin and prints 52 lines of text before advancing to the next page. You can print any number of files in succession without running the program again; the Imagewriter remembers the page specifications until you turn it off.

Robert R. Callahan
Chico, California

Looking for Bugs

Finally, some program pesticide. Several readers have written to complain about bugs in Gerald Keep's Banner Maker program (*Open Window,* November 1985). The program runs properly as printed; if you're having trouble, carefully check your listing for typographical errors, and remember that Microsoft BASIC's List window must be closed for the program to operate. If you don't find any typographical errors, send us a hard copy of the listing you typed along with a detailed description of the problem. If BASIC displayed any error messages, note them along with the lines that generated them.

We've also received word of a bug in the Microsoft BASIC program Concentrate that appeared in last December's column. Line 21 of the program, which reads LI=1, should be deleted.

Open Window *offers tips to help you use the Macintosh more efficiently. Submitted by readers, industry experts, and the* Macworld *staff, items in this department cover various aspects of the Mac and its software, from applications to programming routines to undocumented features.*

Send us a useful tip or even a short program that performs a function or creates a diversion, and we'll share it with our readers. We pay $25 to $100 for each Open Window *item published. Please submit contributions on disk (which will be returned) along with a brief description on paper to* Open Window, Macworld, *555 De Haro St., San Francisco, CA 94107, or send your contribution electronically to CompuServe 70370,702 or The Source BCW440. All published submissions become the property of* Macworld. □

Now with BPI Systems™, you've got a full-time accountant on hand.

When BPI Systems introduced General Accounting, it revolutionized the way businesses automate their accounting. When Apple® introduced Macintosh,™ it revolutionized automation with one-touch personal computing.

Now BPI introduces General Accounting for Macintosh, so Mac users can point and click their way to automated, one-touch accounting.

To take full advantage of Mac's easy-to-use features, BPI General Accounting uses everyday business language and pull-down menus, with an interface consistent with Mac's. And it supports Mac's Mouse functions, so you've got a full-time accountant right at your finger tip.

Of course, General Accounting includes all of the features that made BPI a leader in business accounting software—Accounts Payable, Accounts Receivable and Payroll subsidiary ledgers, plus a flexible chart of accounts, automatic check writing, and comprehensive financial reports.

But hurry. BPI is offering General Accounting for Macintosh at an introductory retail price of $425.

So with a touch of a button you can find out exactly how your business is doing, instead of how it was.

BPI SYSTEMS™

3001 Bee Cave Road, Austin, Texas 78746, 1-800-531-5252.

Apple is a trademark of Apple Computer, Inc. Macintosh is a trademark of Macintosh Laboratories, Inc.

Circle 481 on reader service card

MacBottom 20 Hard Disk Drive. The compact that takes you and your Macintosh for a ride in the fast lane.

Don't let the size of the MacBottom™ hard disk drive fool you. It's the fastest external disk drive you can attach to your Macintosh.

This high capacity, 21 megabyte disk drive weighs just five pounds and fits perfectly under your Macintosh. And because the MacBottom is a mere two inches high, it's a convenient traveling companion—just place it in your carrying case.

Despite its compact size, the MacBottom offers a long list of helpful features. To protect valuable disk data, it has built-in power fail detection. Automatic turn-on needs no extra switches. And automatic head park needs no extra shutdown, even before travel. It can be connected to either the modem or printer port—it knows which, automatically! Or connect a MacBottom to each port!

The MacBottom includes variable size volume allocation FROM THE DESKTOP that utilizes all available space efficiently. The MacBottom also provides you with fast and foolproof backup. And to free your Macintosh for more work, the MacBottom offers a huge printer buffer-up to 4 megabytes!

The compact MacBottom hard disk drive. Its unique combination of features produce the most efficient Macintosh ever! It comes with a full six month warranty, including parts and labor. Let one take you and your Macintosh for a ride in the fast lane, soon.

MAC BOTTOM

Personal Computer Peripherals Corporation
6204 Benjamin Road, Tampa, Florida 33614
(813) 884-3092 (800) MACBUTT

PROUDLY MADE IN THE U.S.A.

™Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 223 on reader service card